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(12) **United States Patent**
Rutledge

(10) **Patent No.: US 9,206,595 B2**
(45) **Date of Patent: Dec. 8, 2015**

(54) **HANDMADE STRUCTURE SYSTEM**

(76) Inventor: **Richard Bruce Rutledge**, Bloomfield, KY (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 433 days.

(21) Appl. No.: **13/153,453**

(22) Filed: **Jun. 5, 2011**

(65) **Prior Publication Data**

US 2012/0304549 A1 Dec. 6, 2012

(51) **Int. Cl.**

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E04H 1/00	(2006.01)
E04B 1/343	(2006.01)
E04B 7/02	(2006.01)
E04D 13/064	(2006.01)
E04D 13/08	(2006.01)
E04C 3/32	(2006.01)

(52) **U.S. Cl.**

CPC ***E04B 1/34315*** (2013.01); ***E04B 7/026*** (2013.01); ***E04B 7/028*** (2013.01); ***E04D 13/064*** (2013.01); ***E04D 13/0645*** (2013.01); ***E04D 13/08*** (2013.01); *E04C 3/32* (2013.01)

(58) **Field of Classification Search**

CPC E04D 13/0645; E04D 13/064; E04B 1/34315; E04B 7/026; E04H 1/12–1/14

USPC 52/362, 264, 270, 271, 79.1, 79.12

See application file for complete search history.

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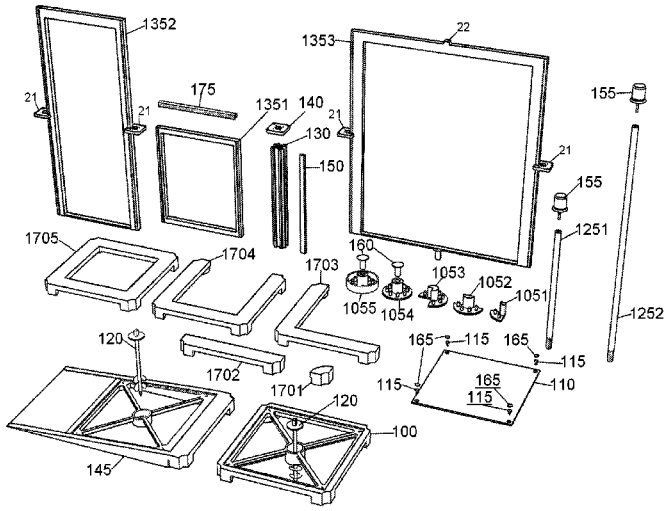
Primary Examiner — Elizabeth A Plummer

(57) **ABSTRACT**

A system of integrated structural components, designed to fit and connect together using no tools other than human hands, allowing persons with little or no construction experience to assemble floored/partitioned/roofed structures of variable shape(s) and surface area(s). Flooring panels are inserted and secured into flooring frames that have been inserted and secured into frame connectors. Flooring frames may be anchored into an outdoor installation surface for long term use. Certain configurations of the frame connector allow for the installation of variable height partition supports, as well as partition panels. A special configuration of the flooring frame allows for wheeled implement/conveyance access to the floored surface from the surrounding surface. Open, unfloored areas may be created within the periphery of a structure. Roof panels are installed onto and supported by roof brackets, roof beams and integrated gutter sections. Precipitation is conveyed to downspout pipes and fittings via downspouts.

8 Claims, 38 Drawing Sheets



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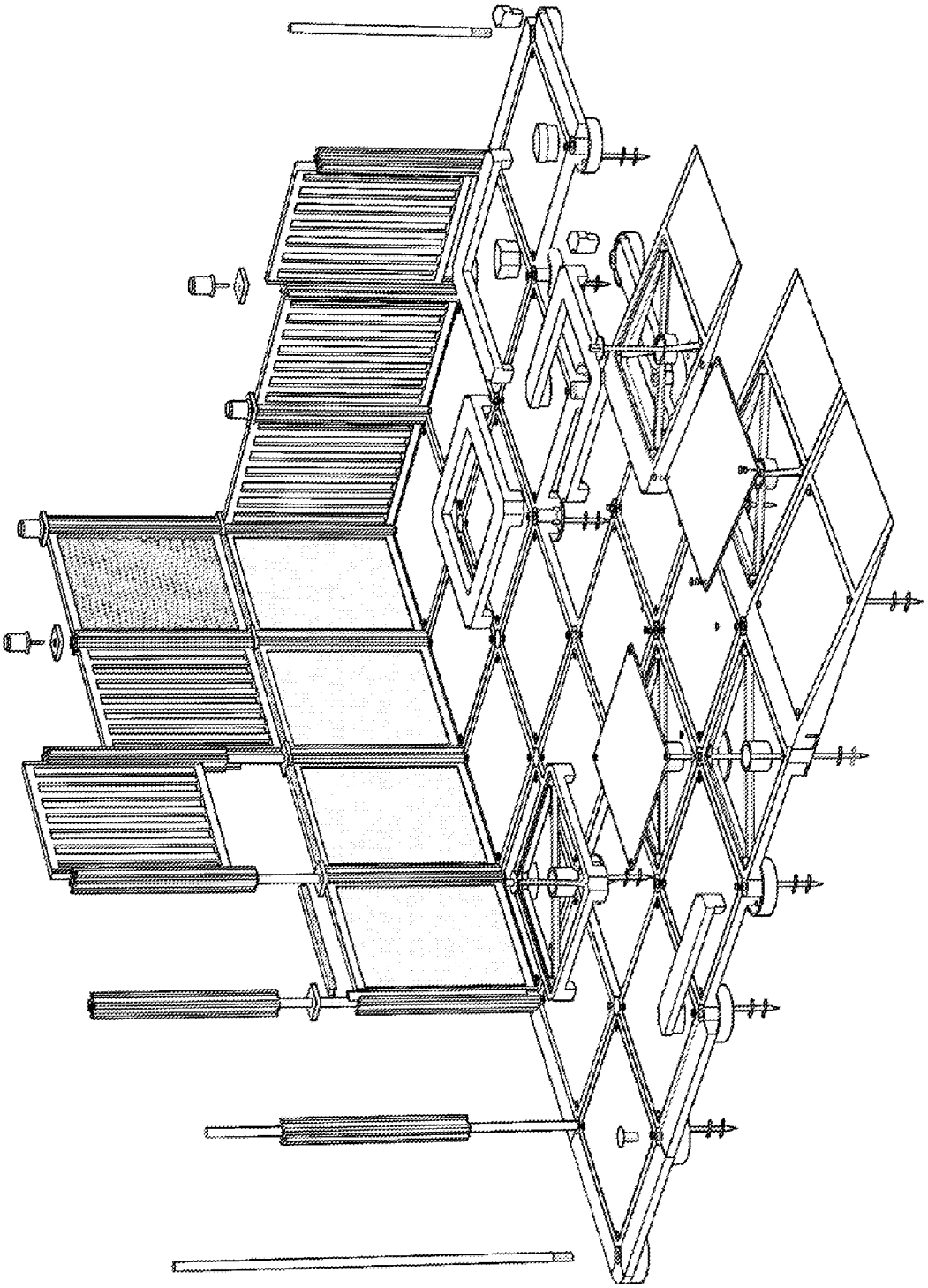
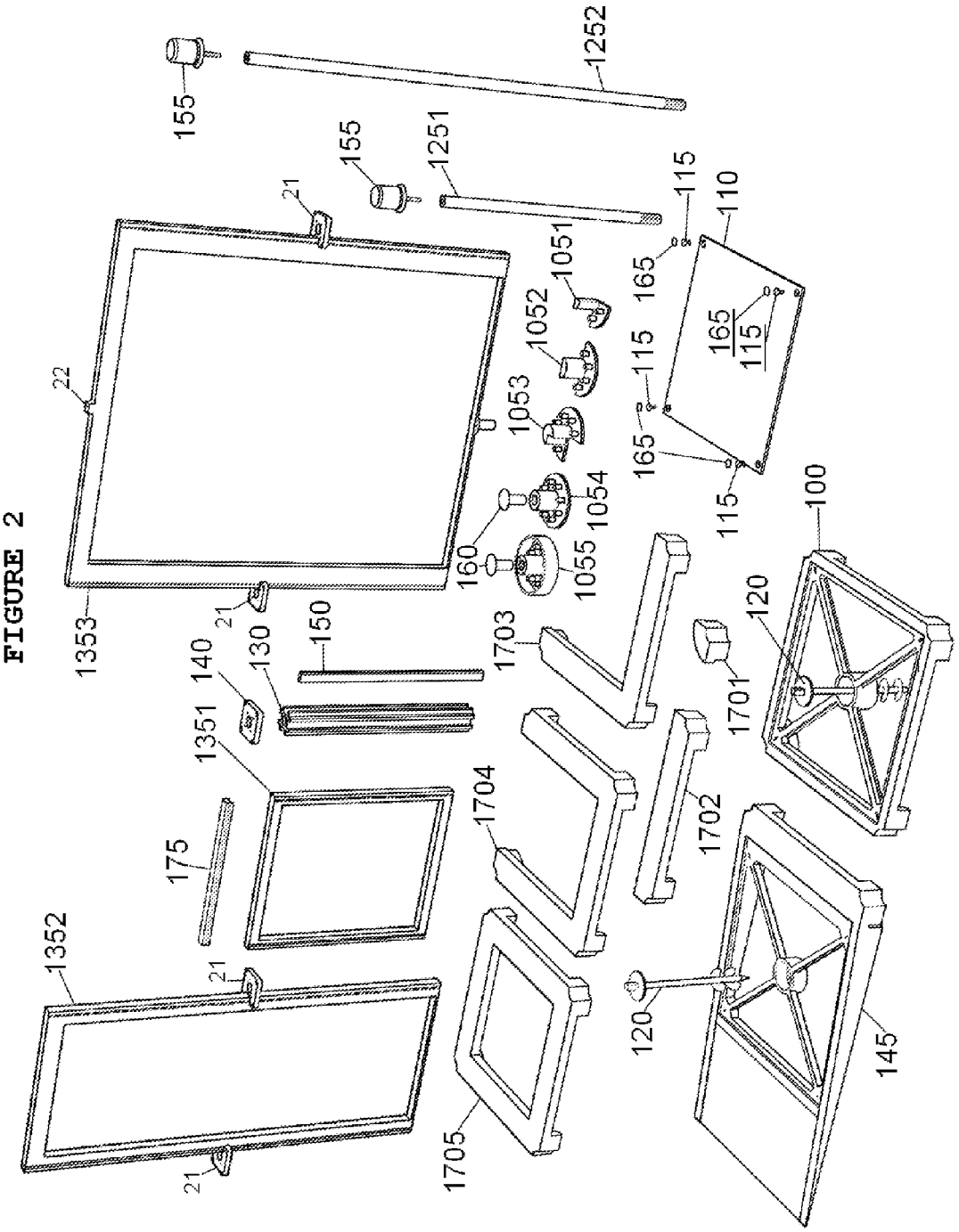


FIGURE 1

FIGURE 2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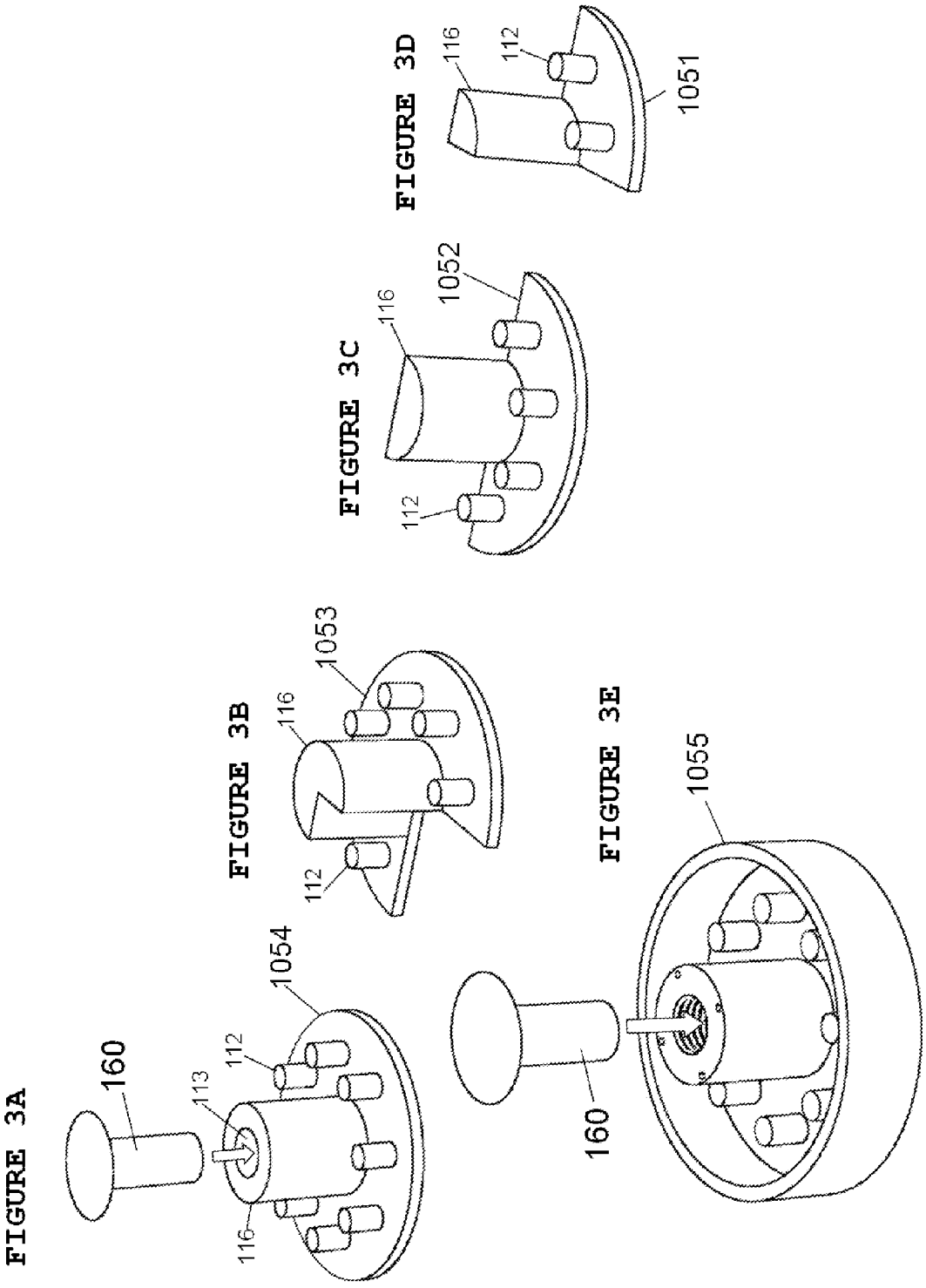
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FIGURE 4A

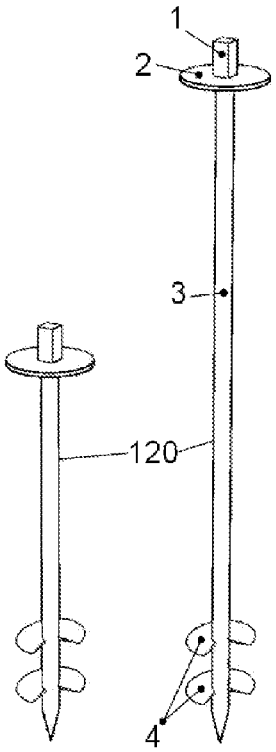


FIGURE 4B

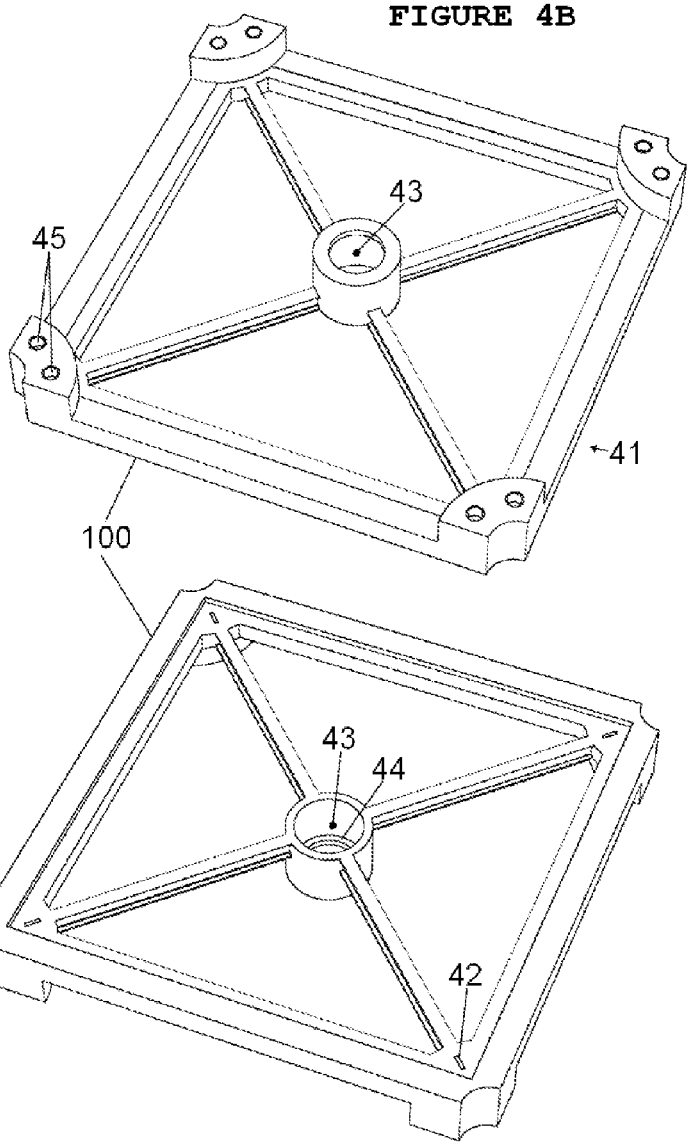


FIGURE 5A

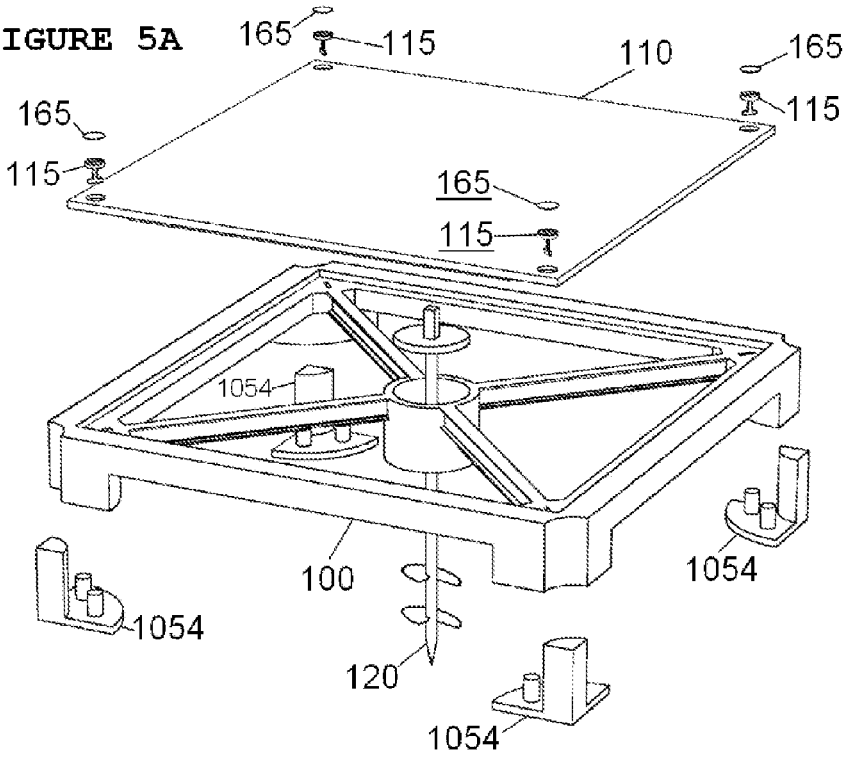
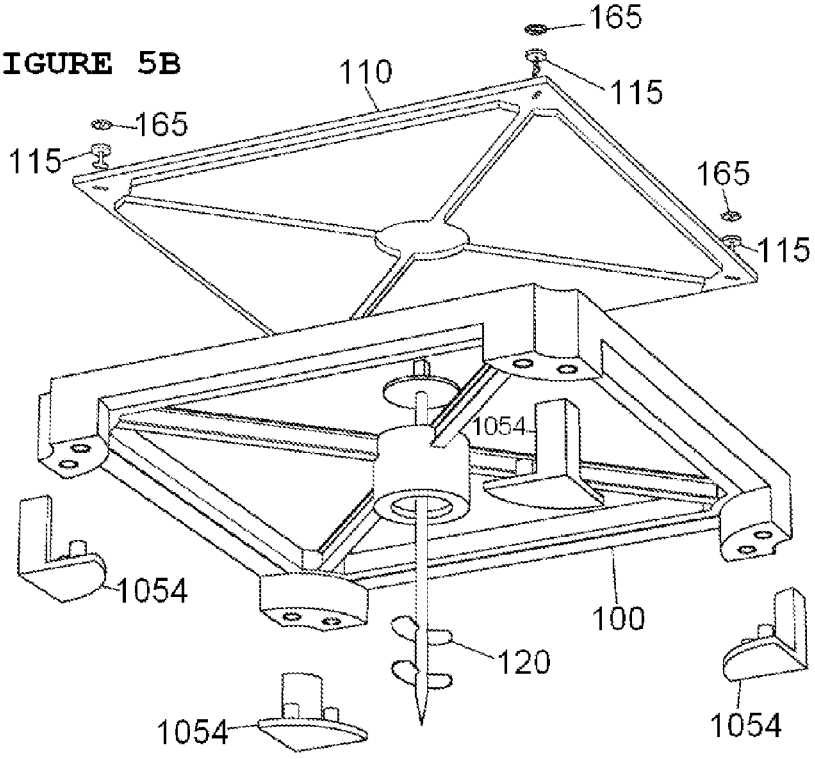


FIGURE 5B



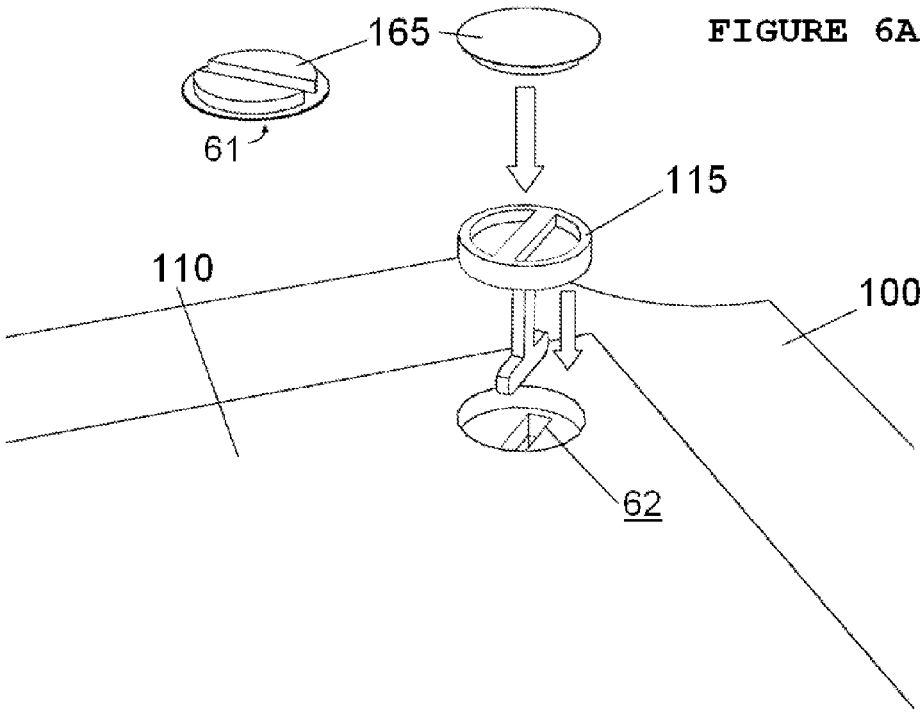


FIGURE 6A

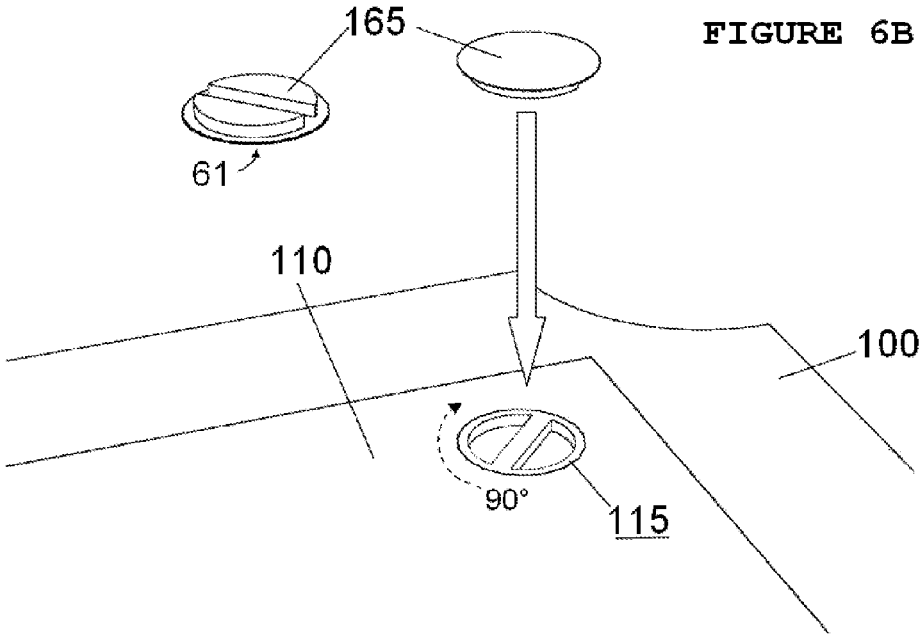


FIGURE 6B

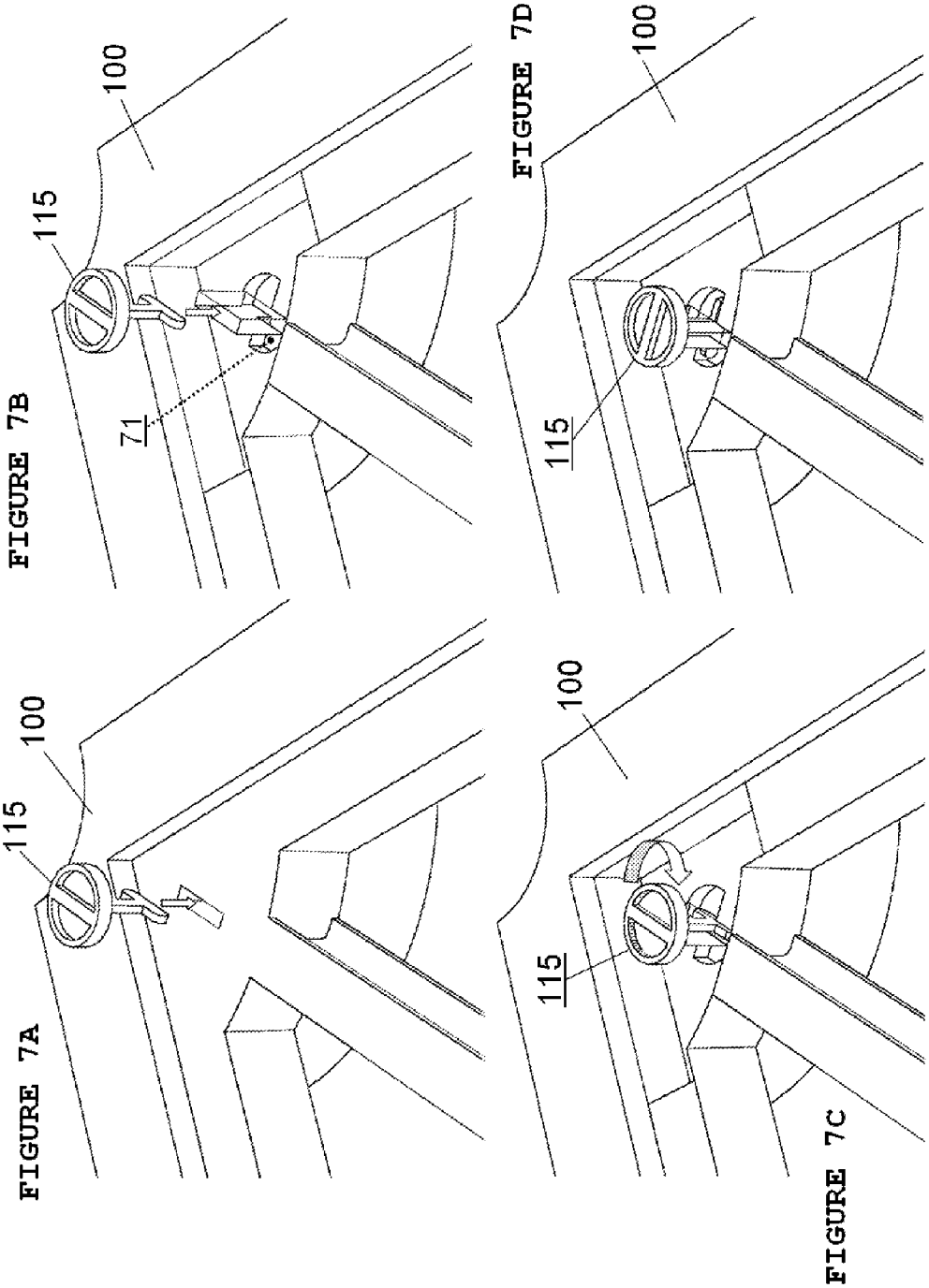


FIGURE 7A

FIGURE 7B

FIGURE 7C

FIGURE 7D

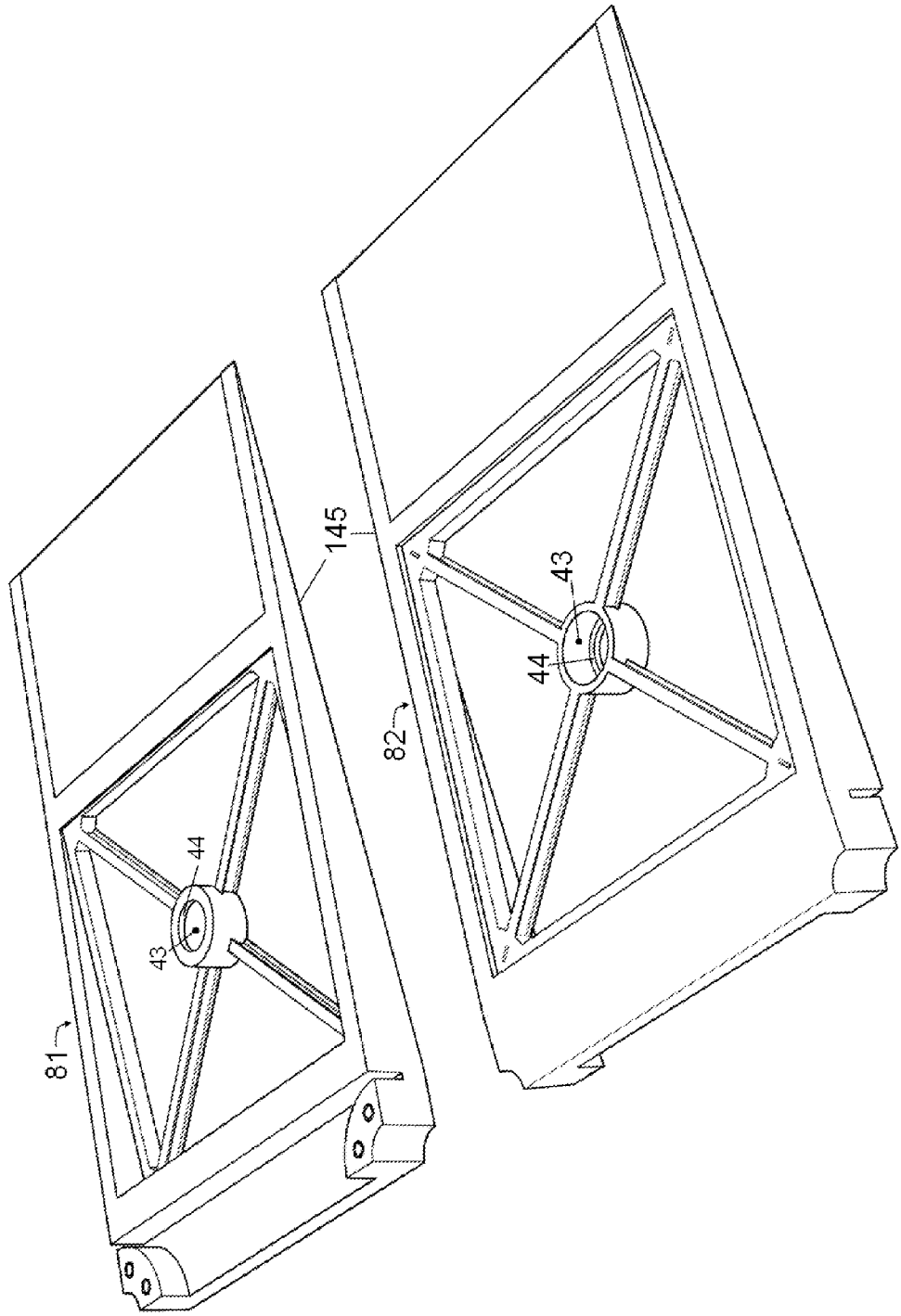


FIGURE 8

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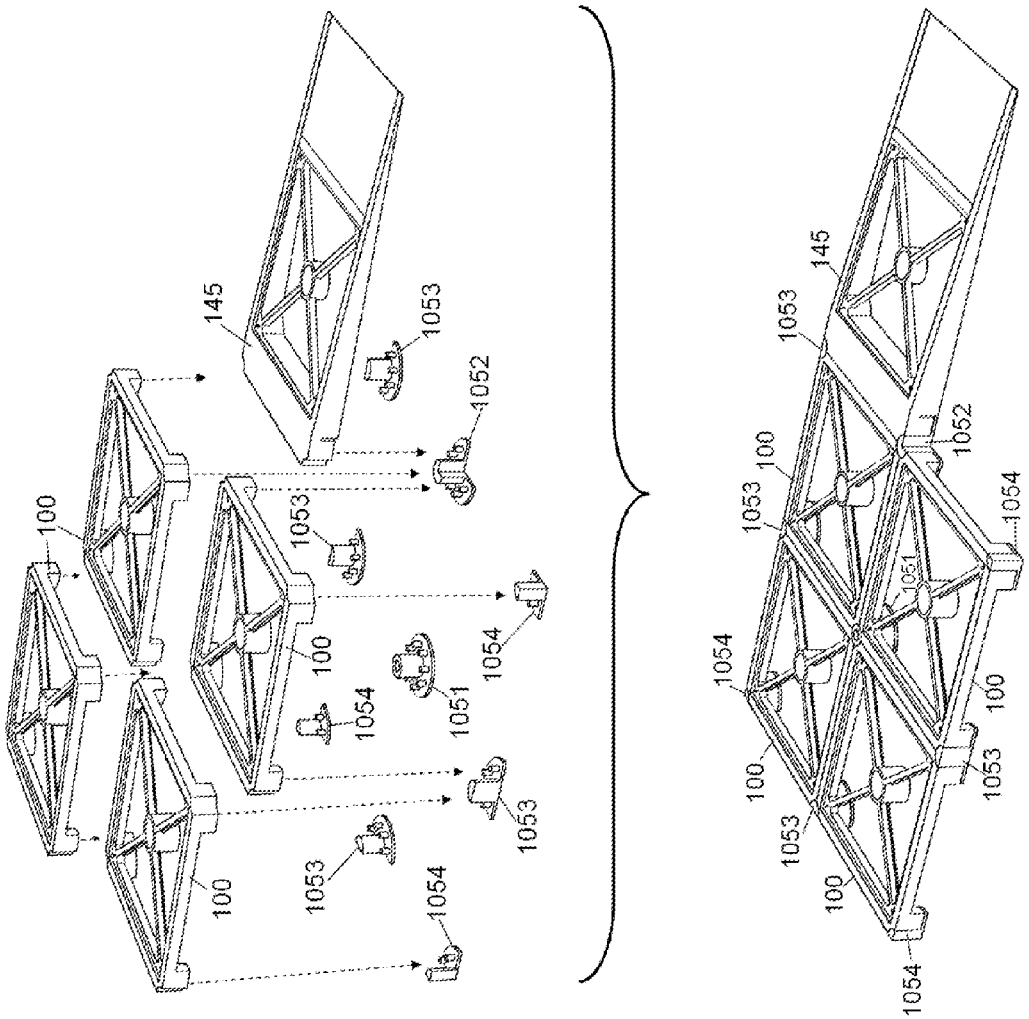
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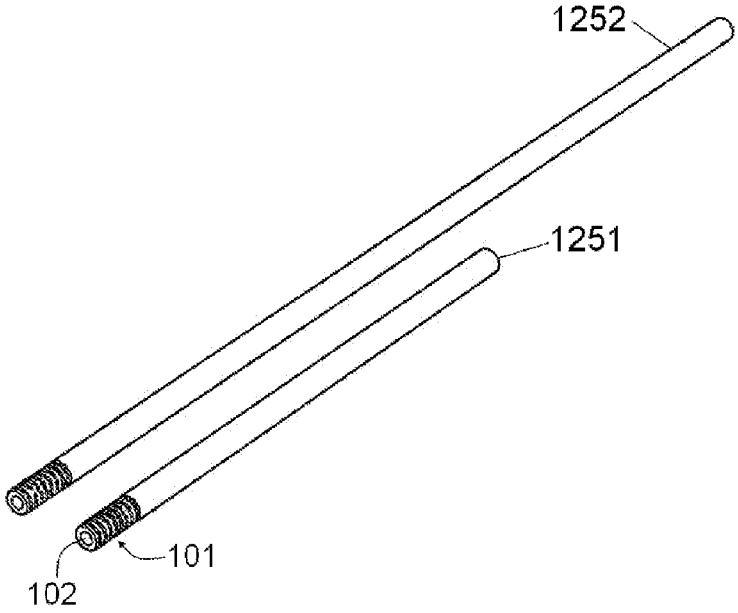
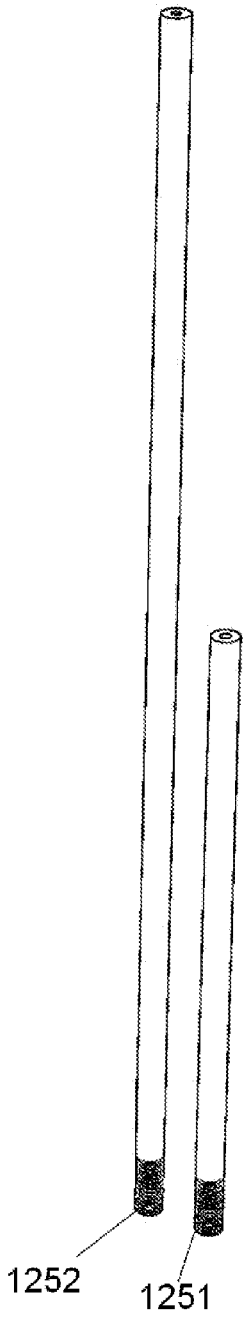
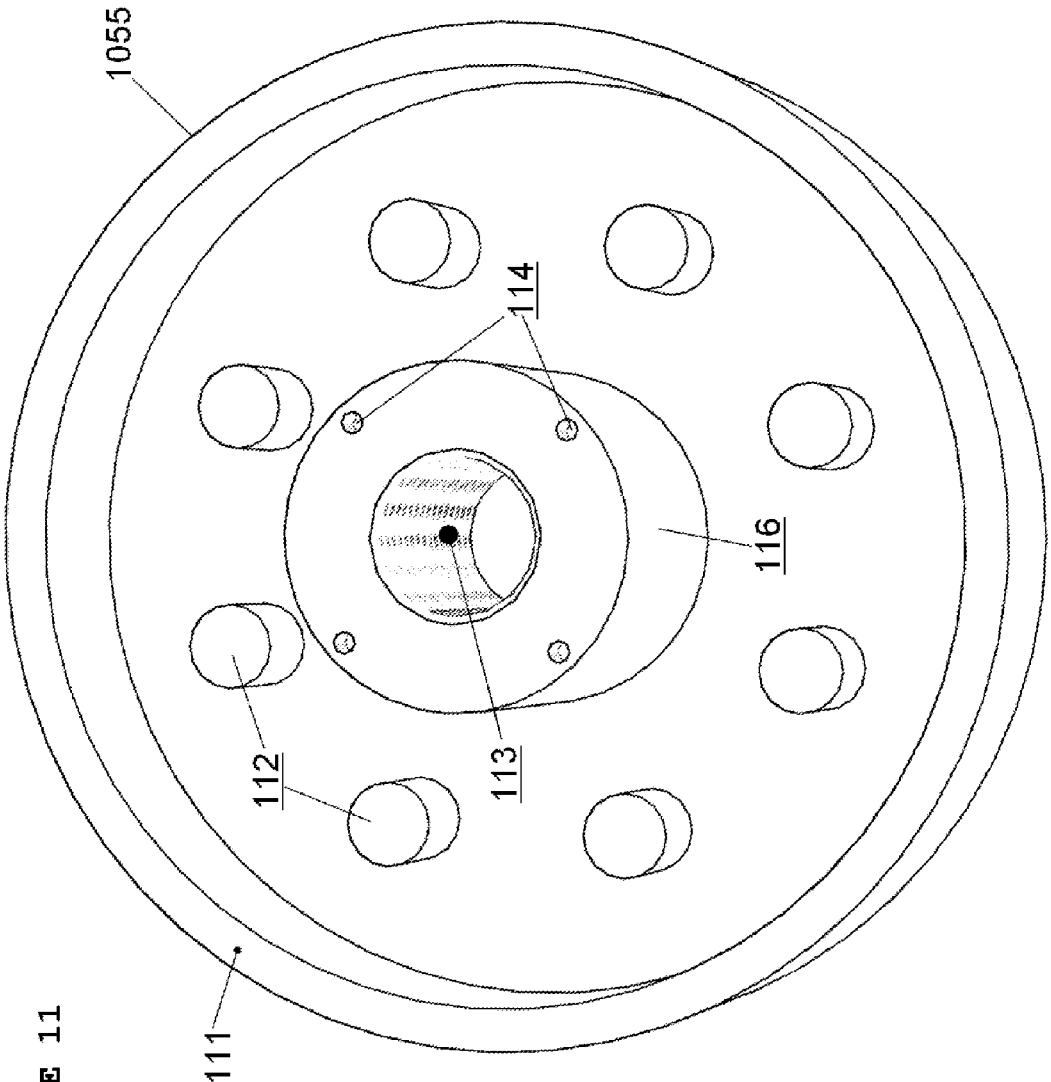
FIGURE 10







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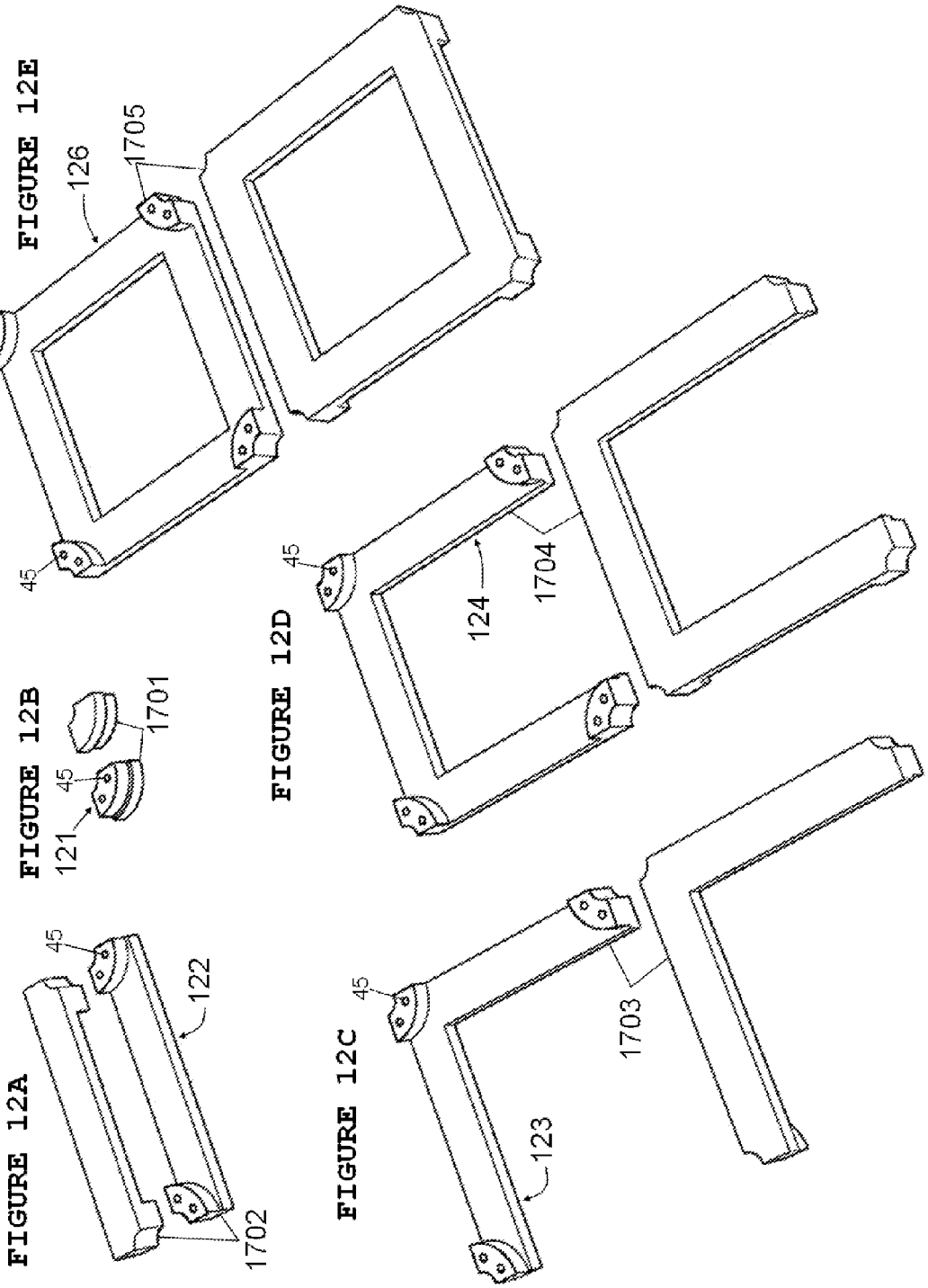
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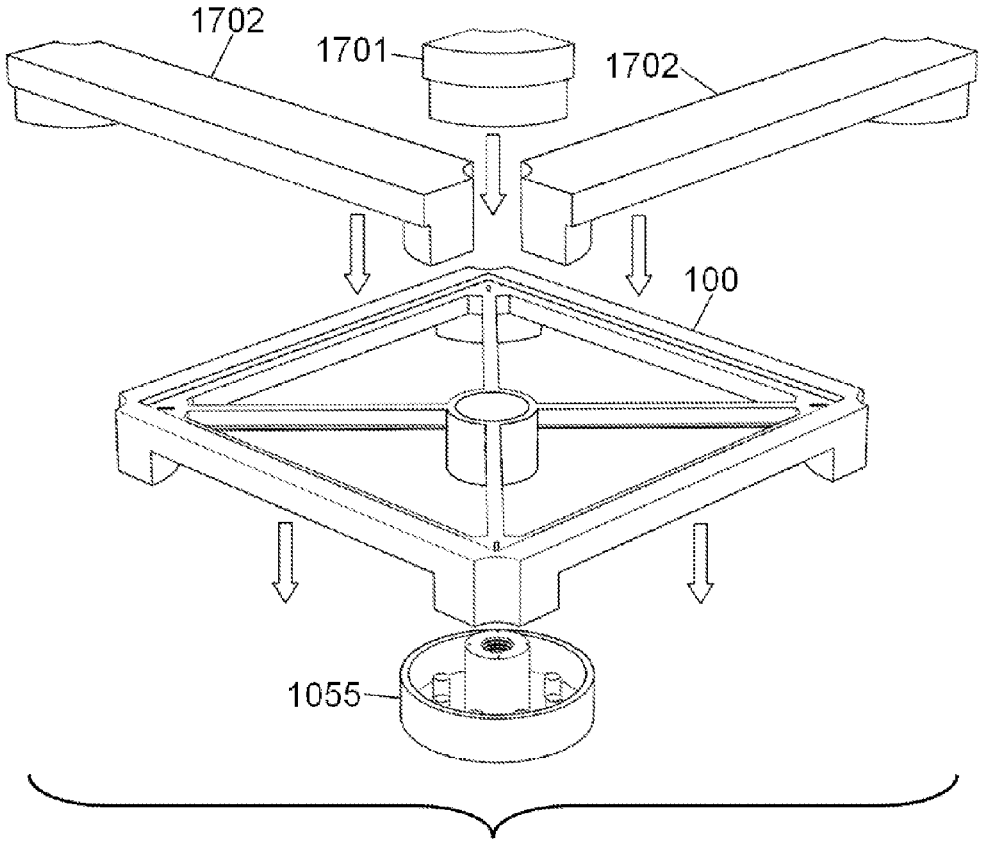
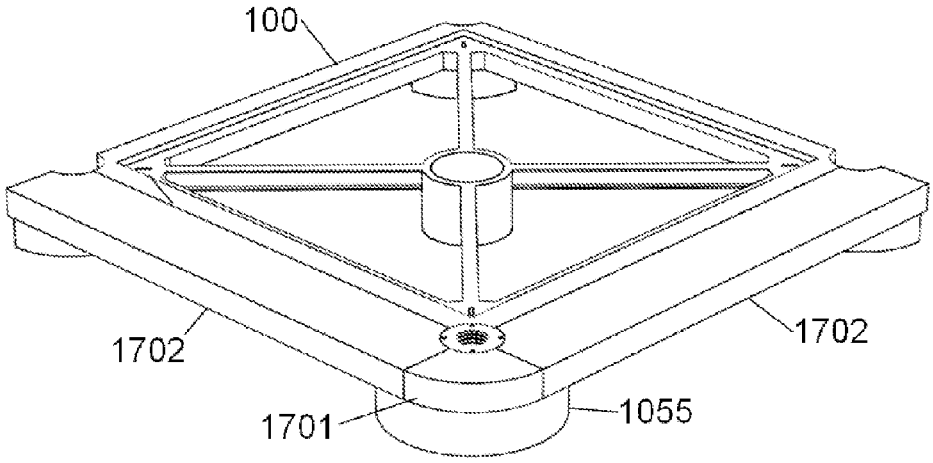
FIGURE 13





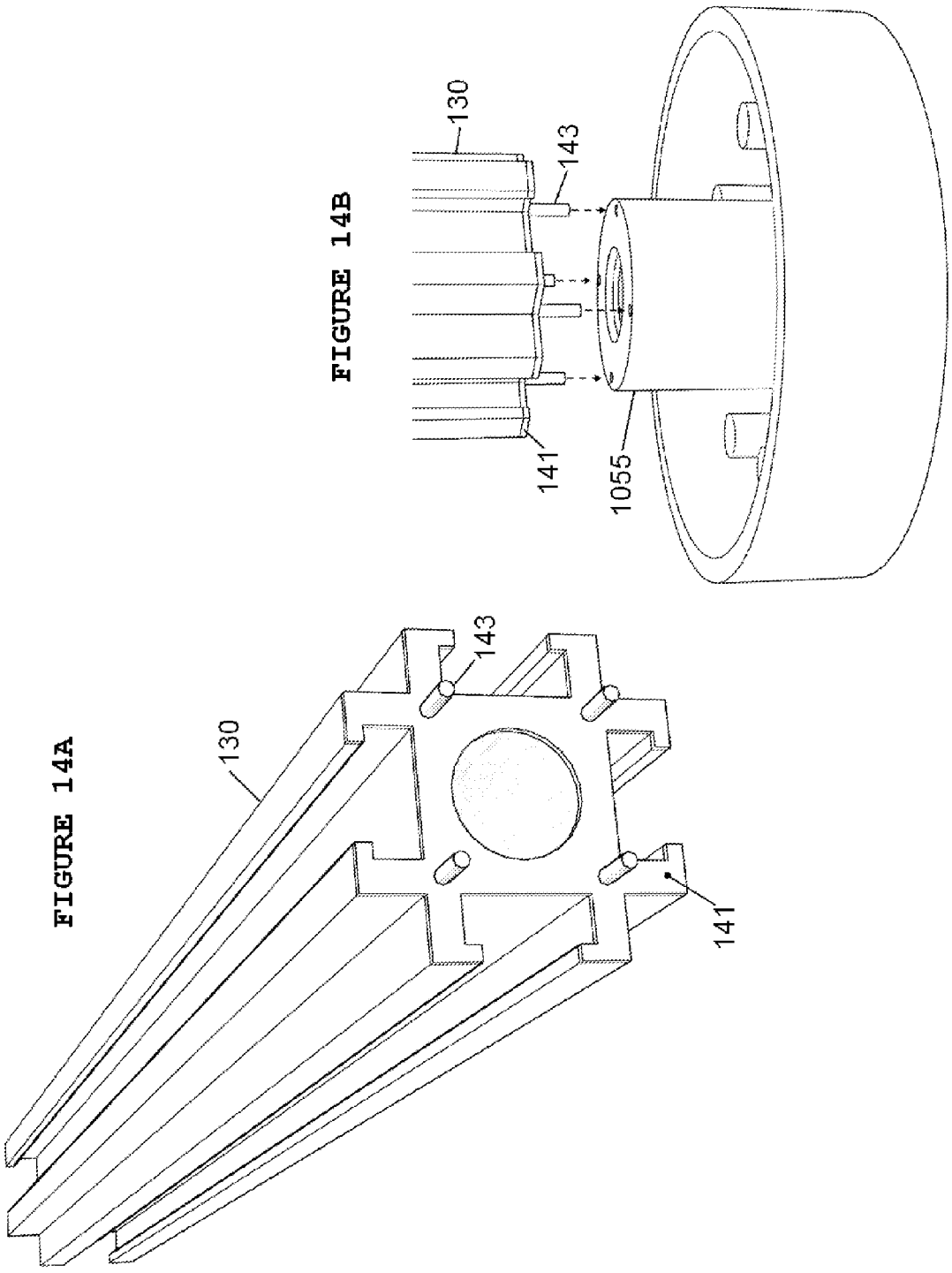
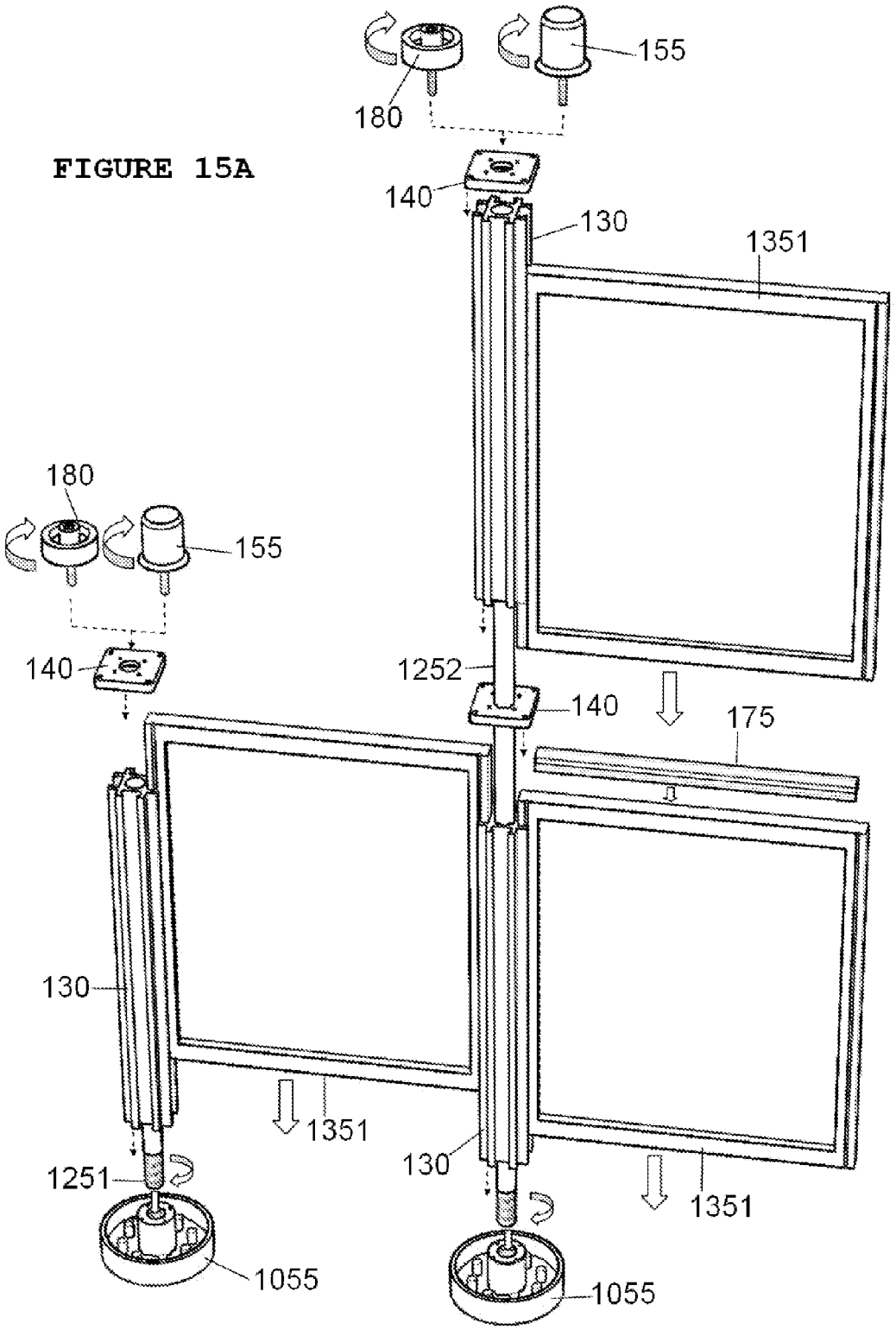


FIGURE 14B

FIGURE 14A

FIGURE 15A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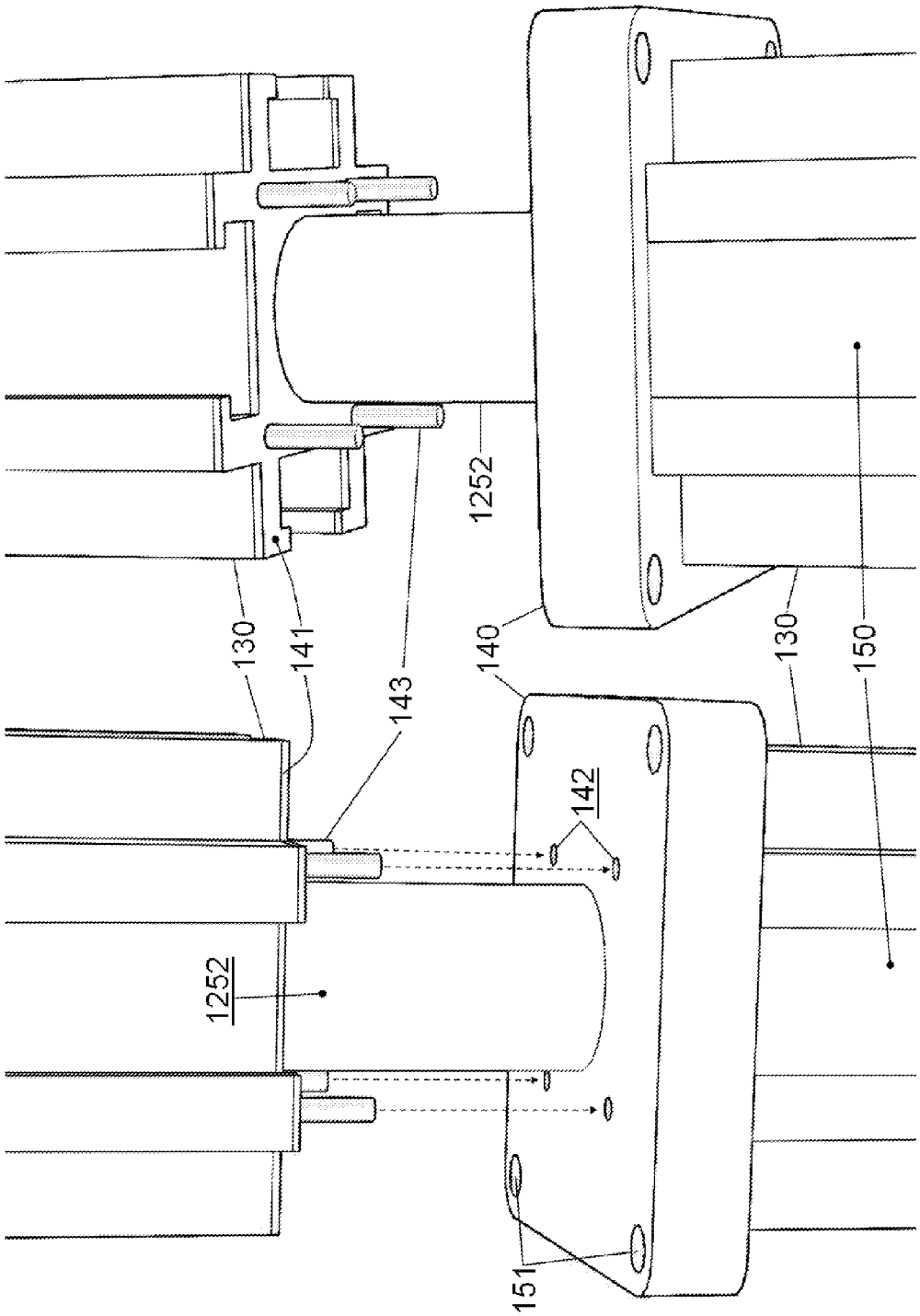


FIGURE 15B

FIGURE 15E

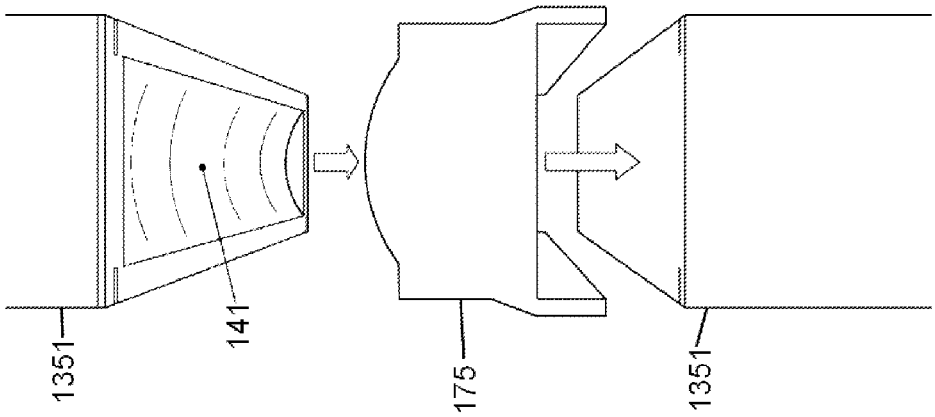


FIGURE 15D

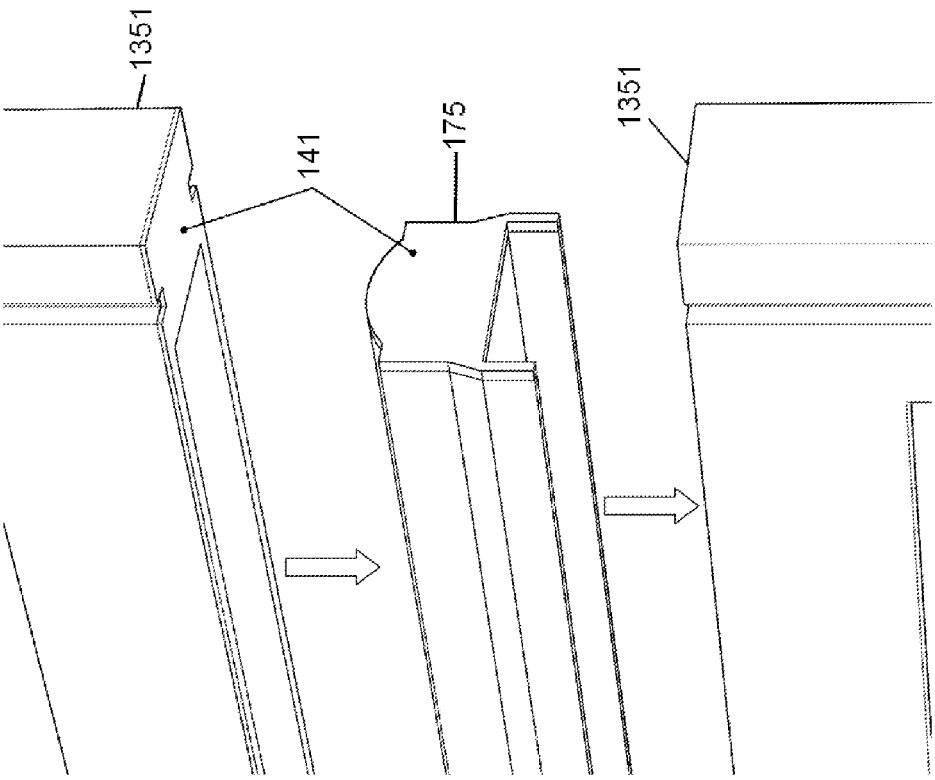
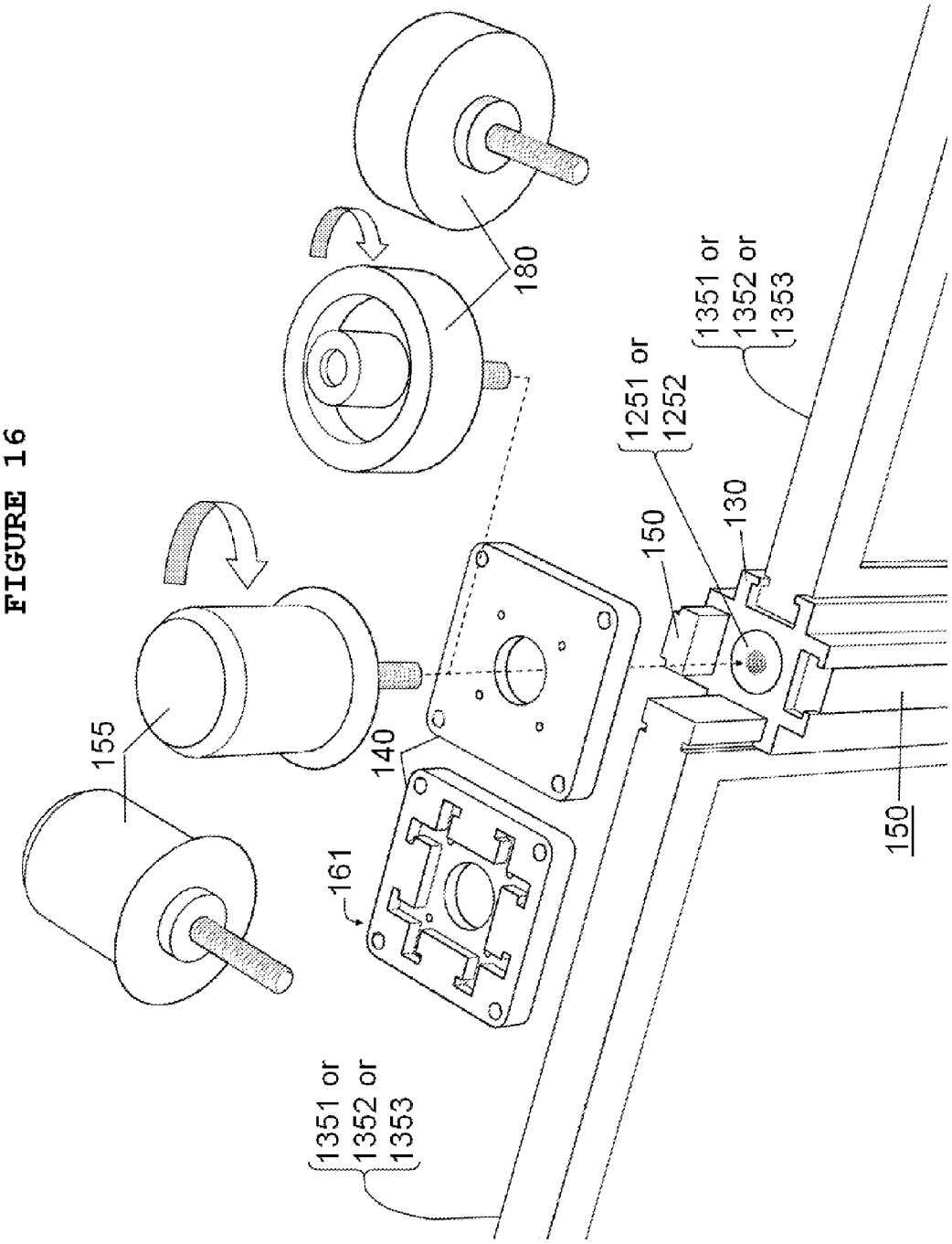


FIGURE 16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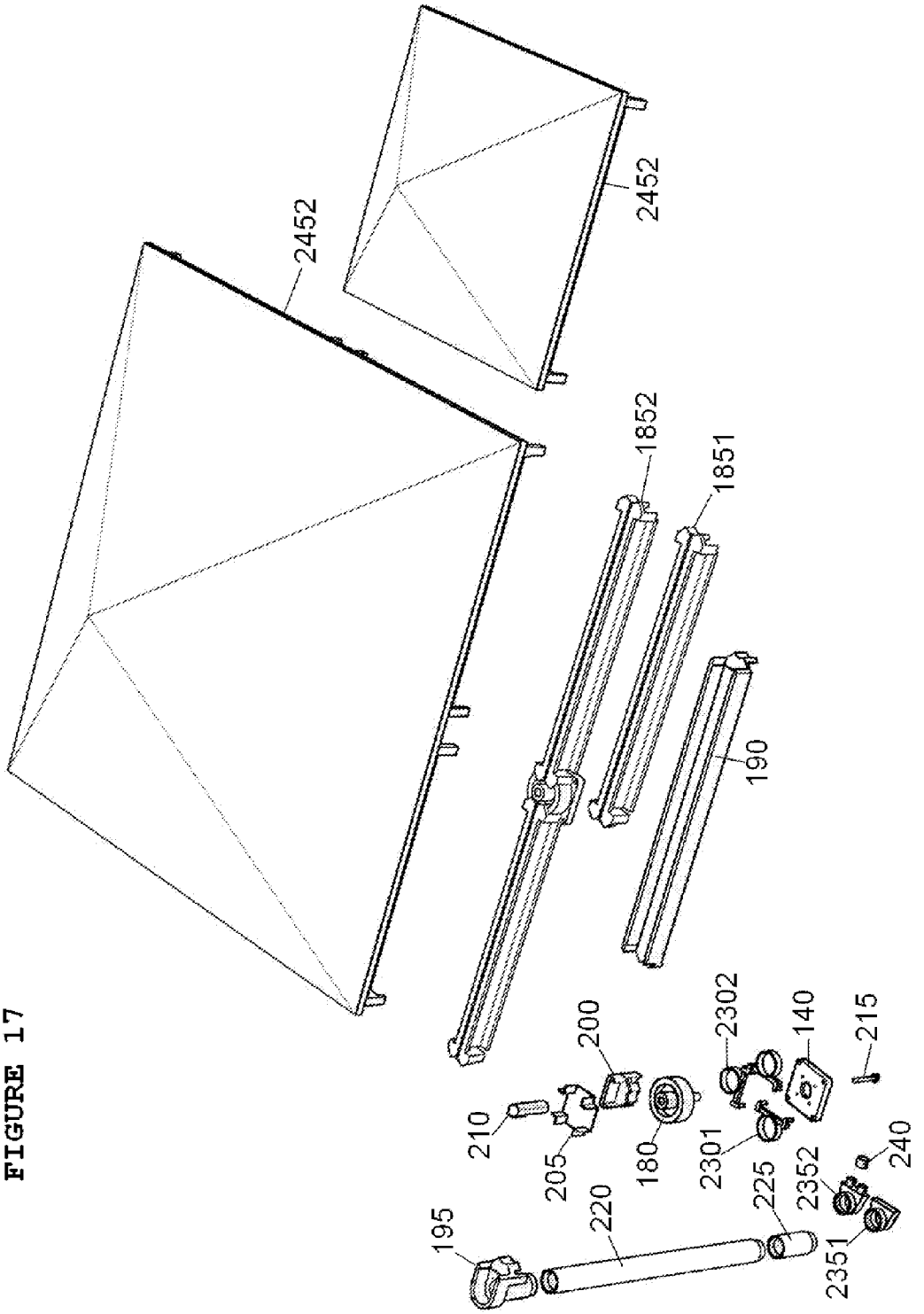
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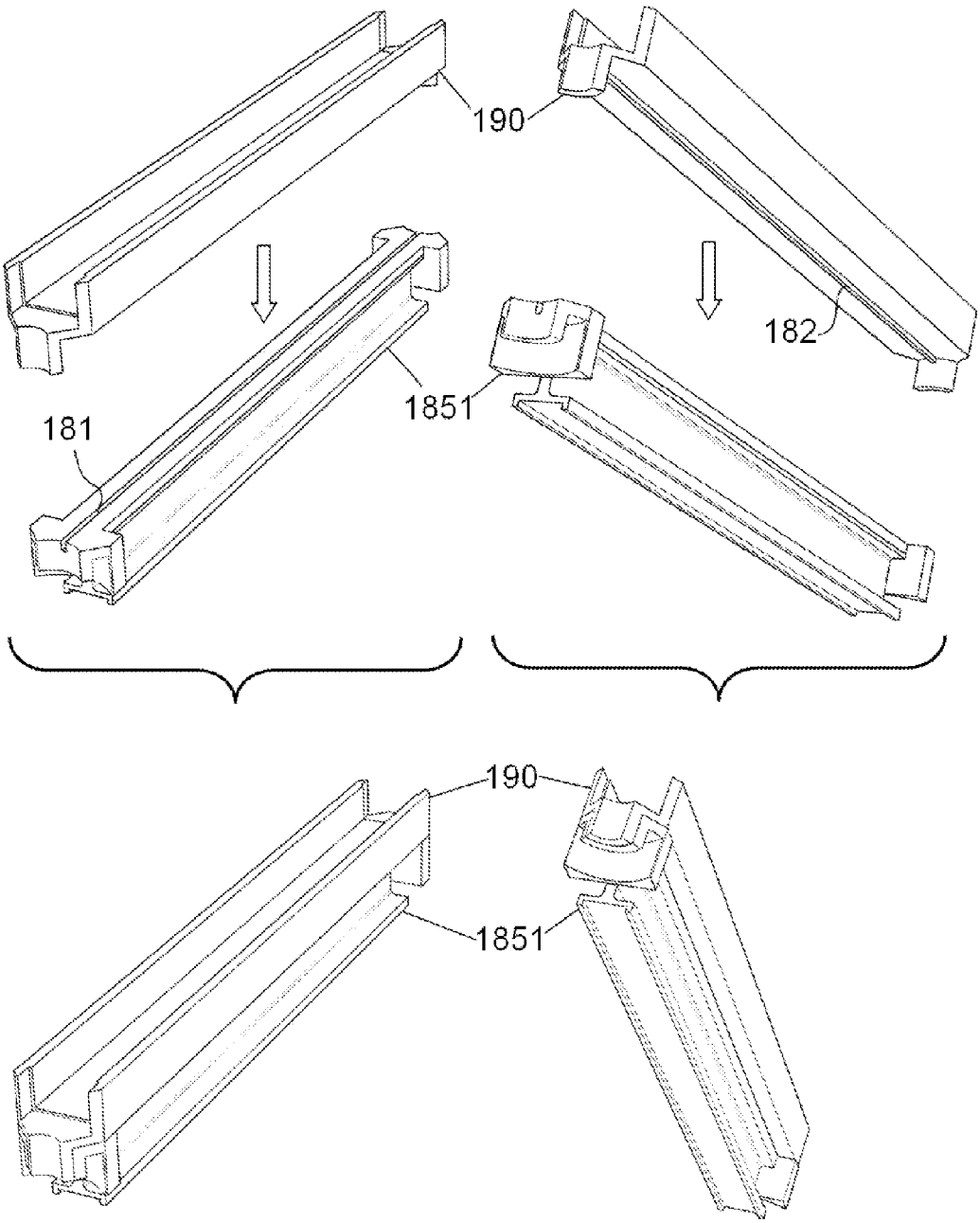
FIGURE 17

FIGURE 18A

FIGURE 18B



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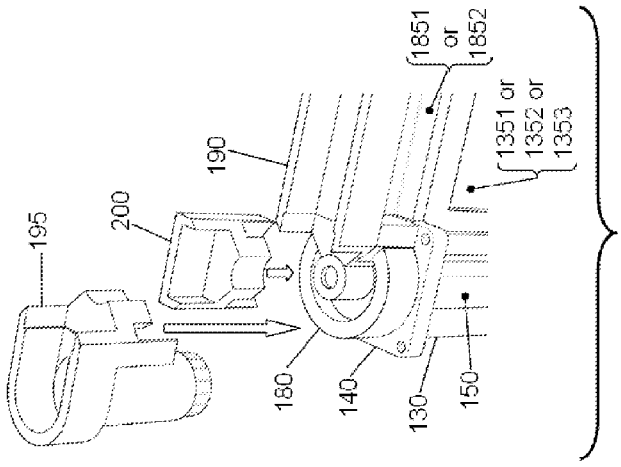

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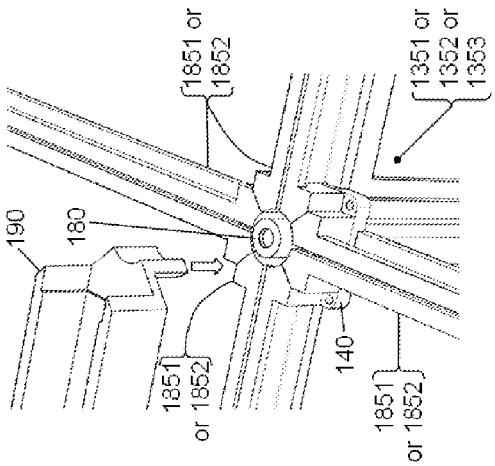

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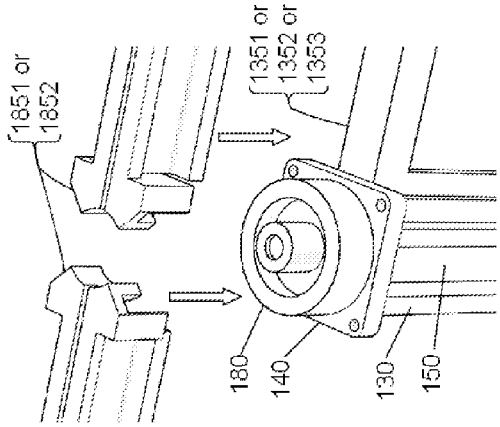

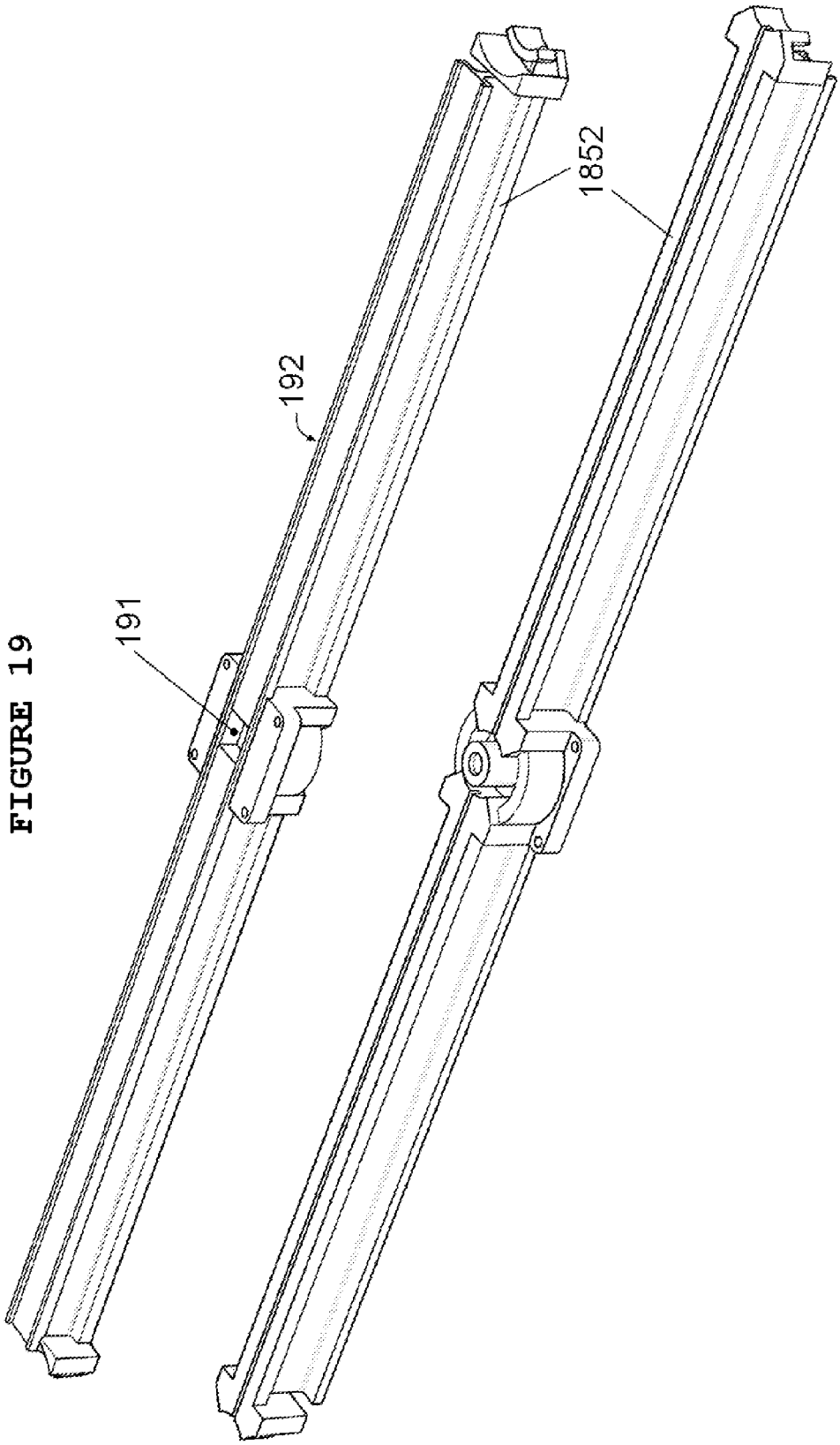

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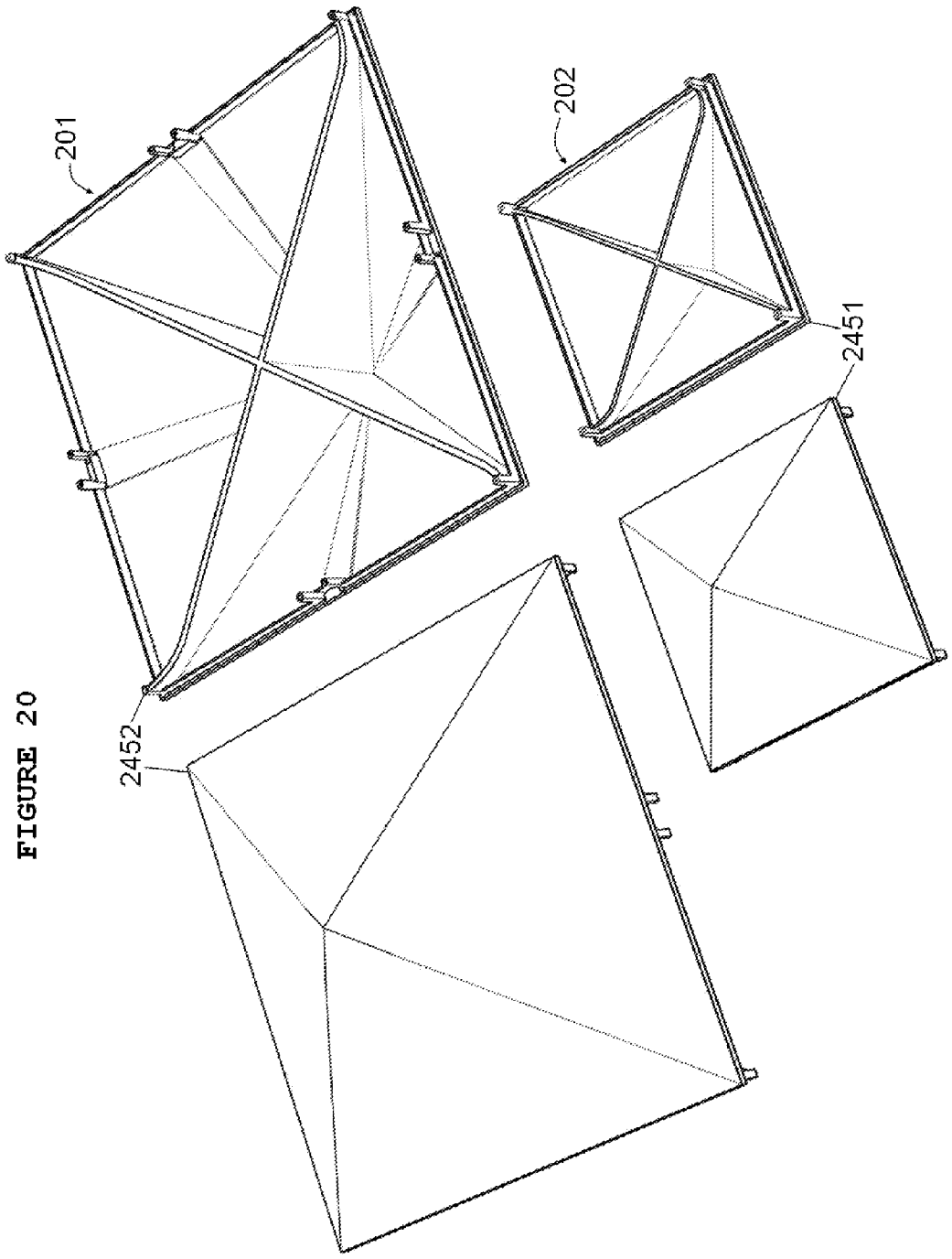
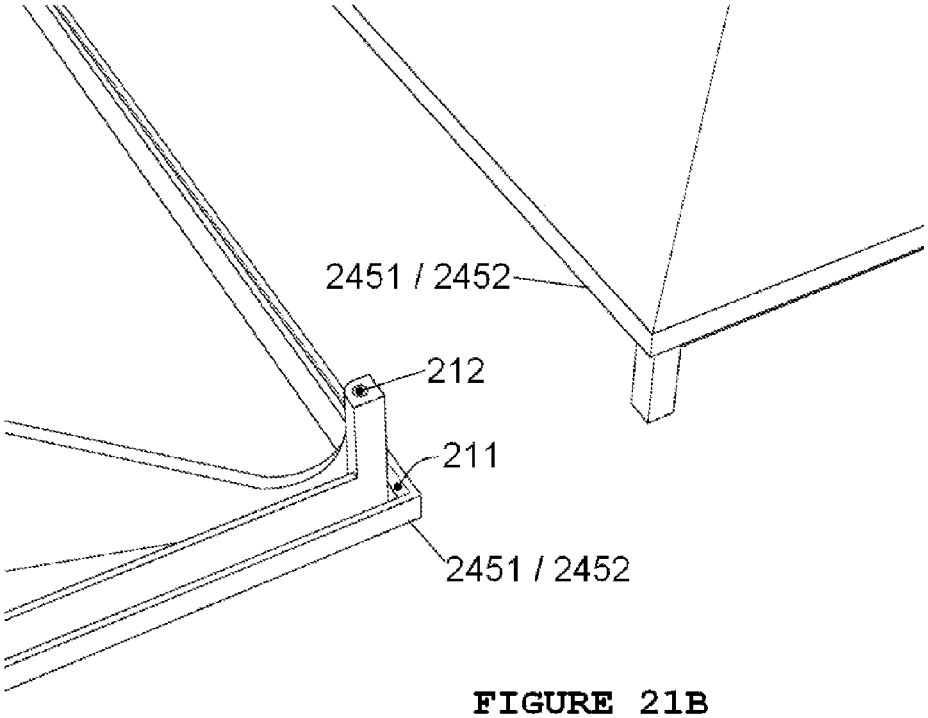


FIGURE 20

FIGURE 21A



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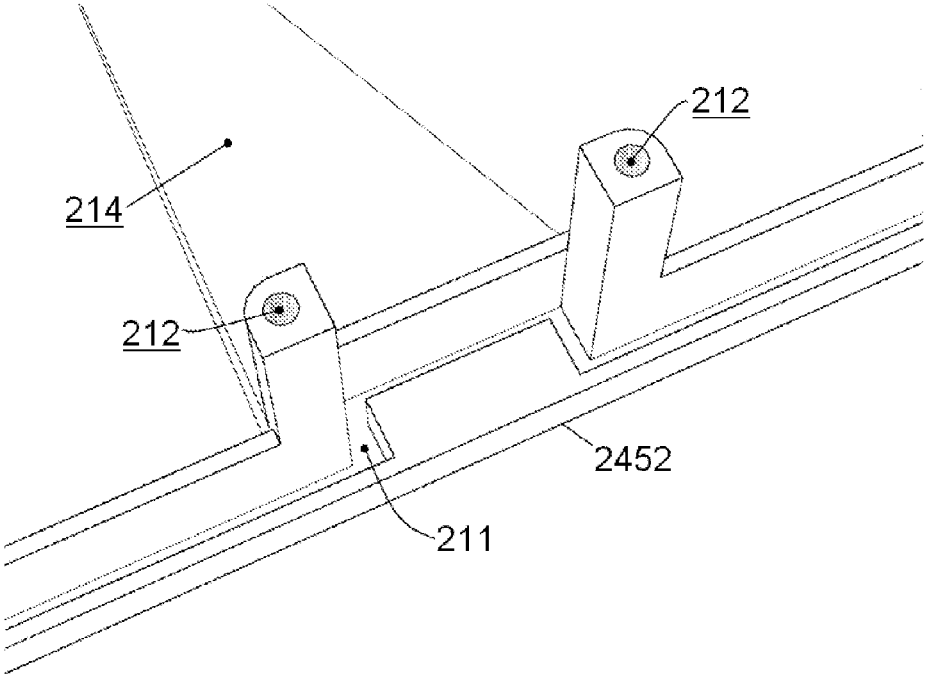

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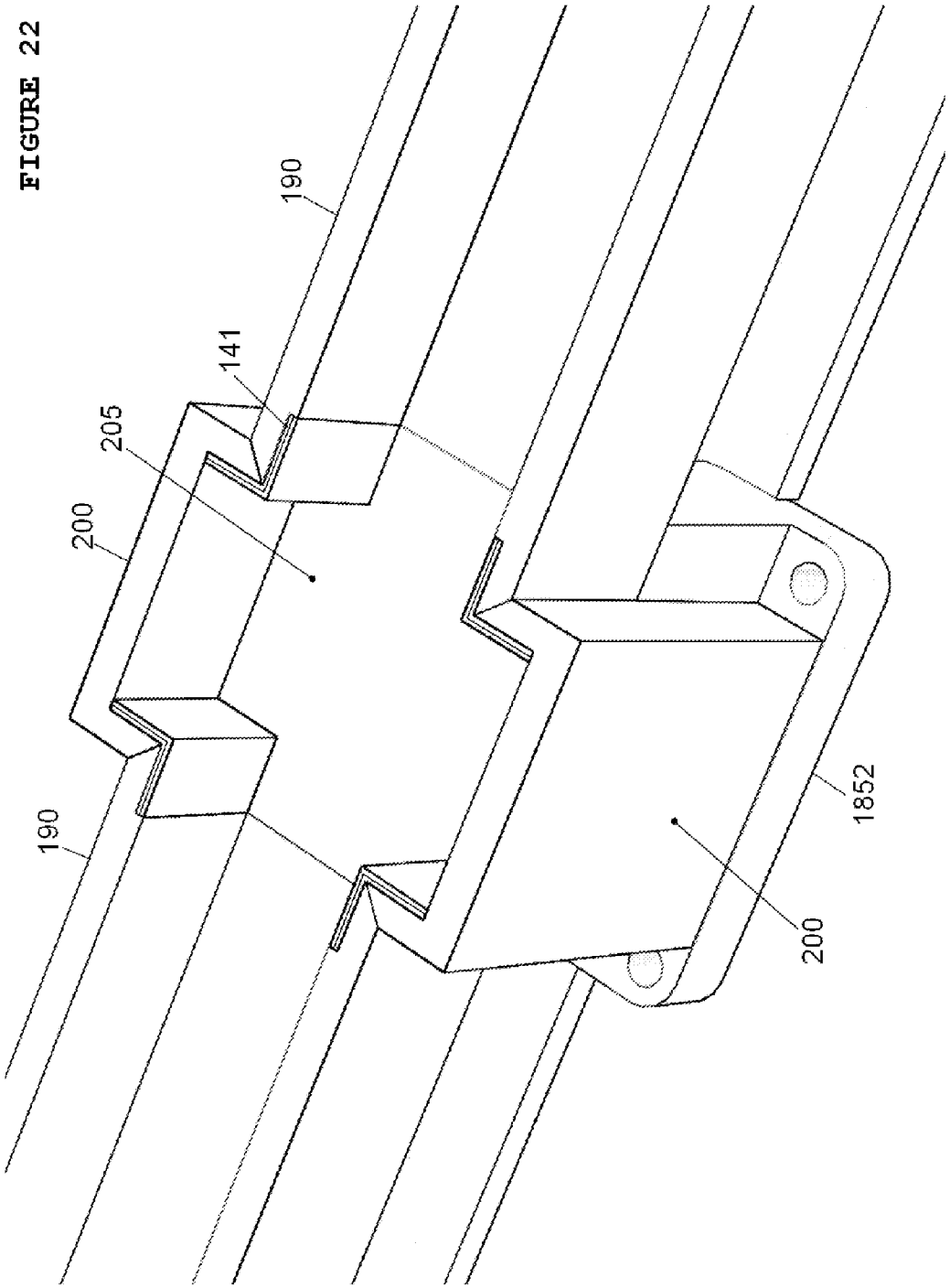

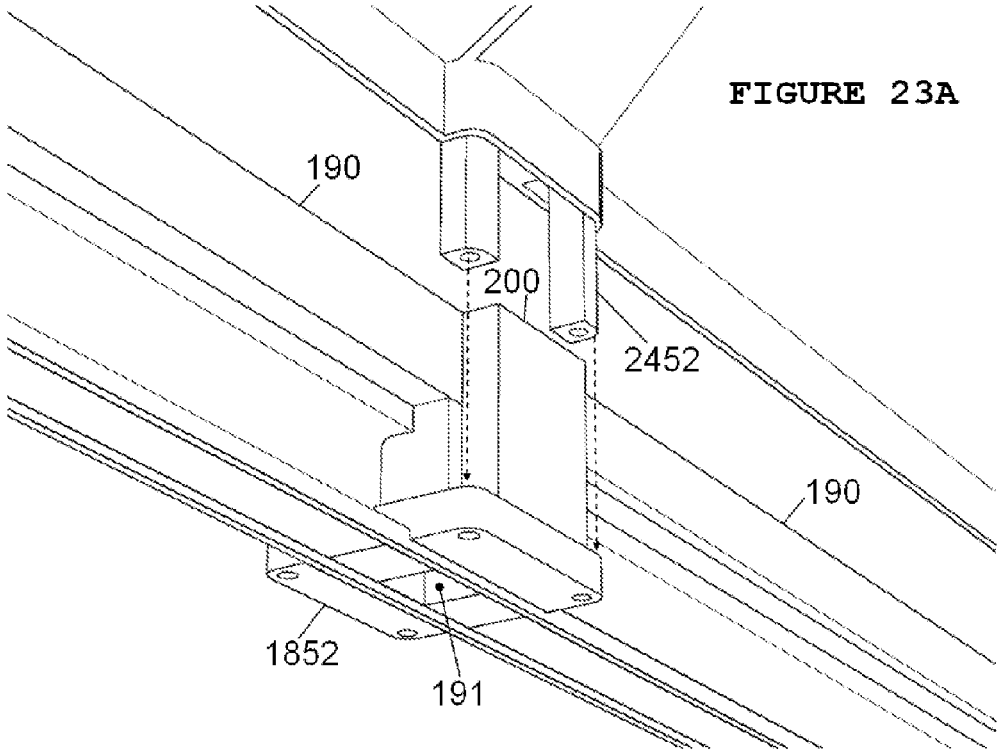

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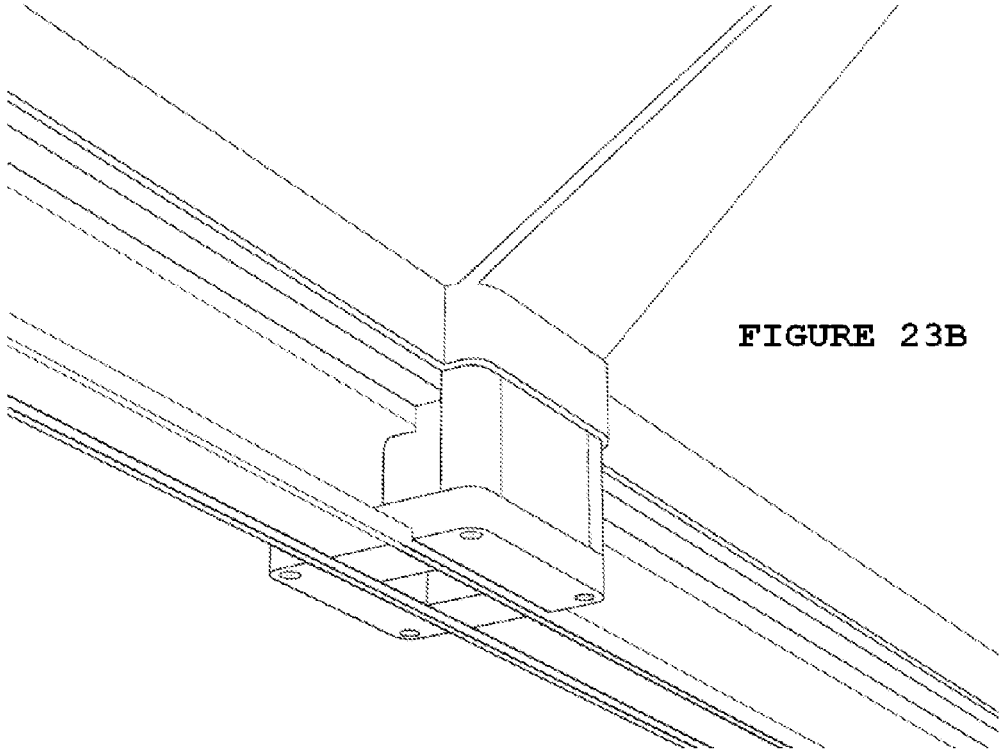


FIGURE 23B

FIGURE 24A

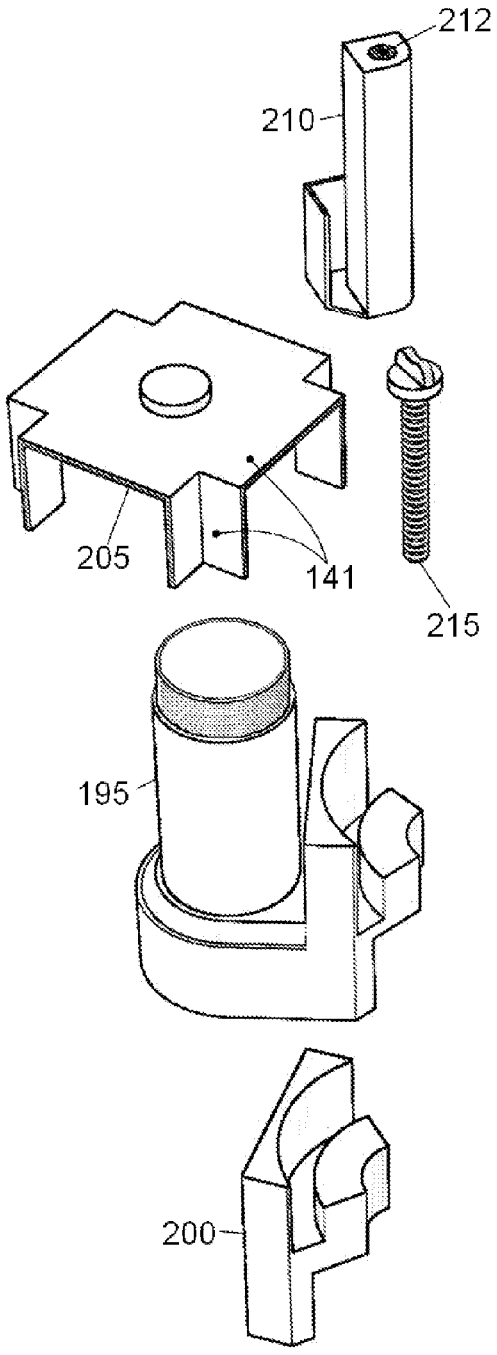
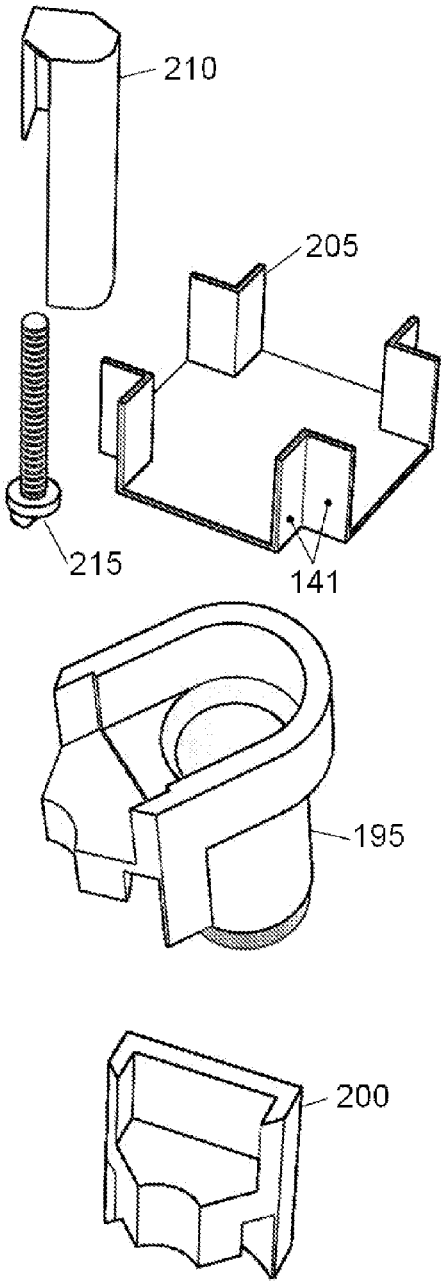


FIGURE 24B



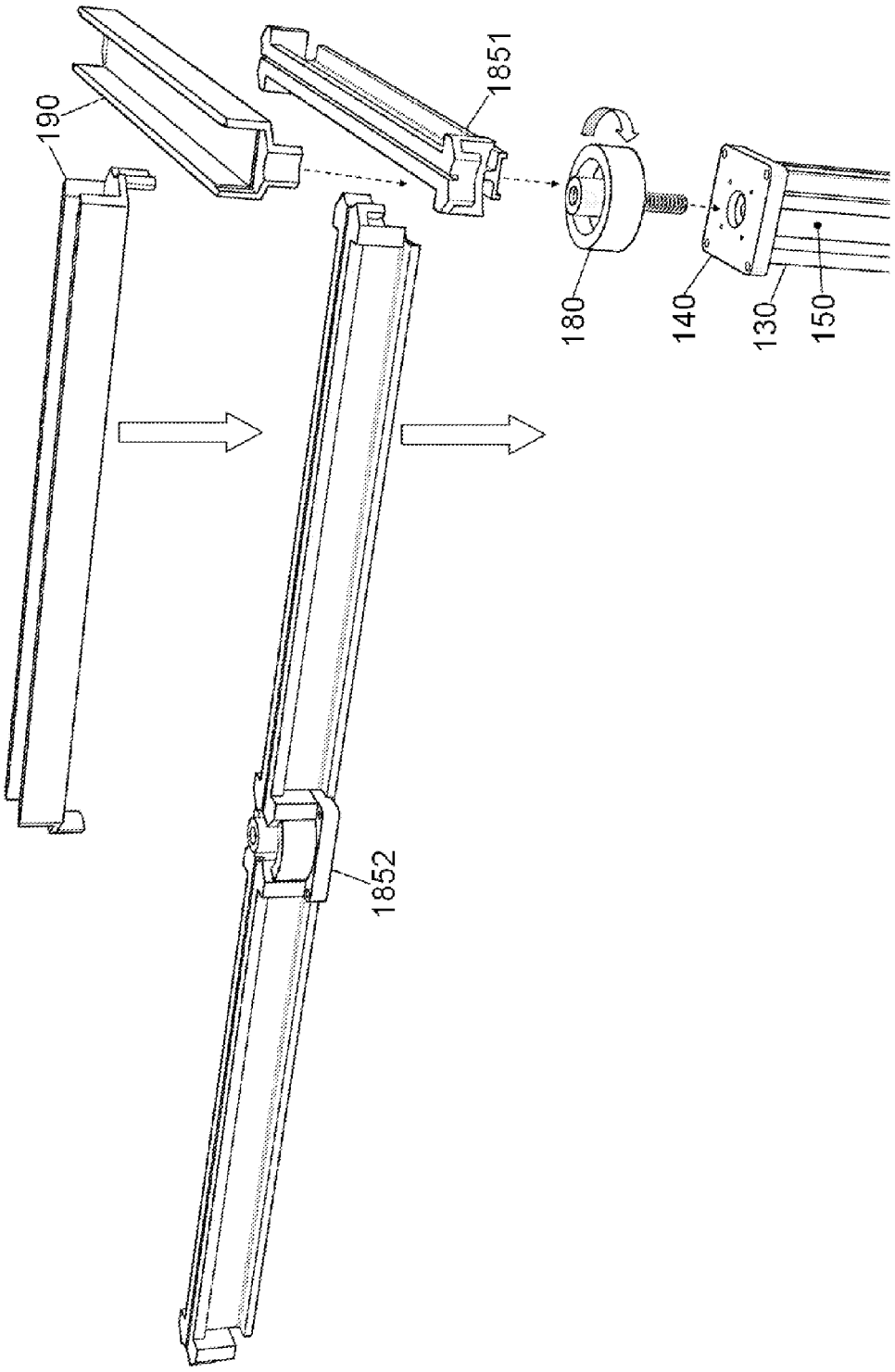
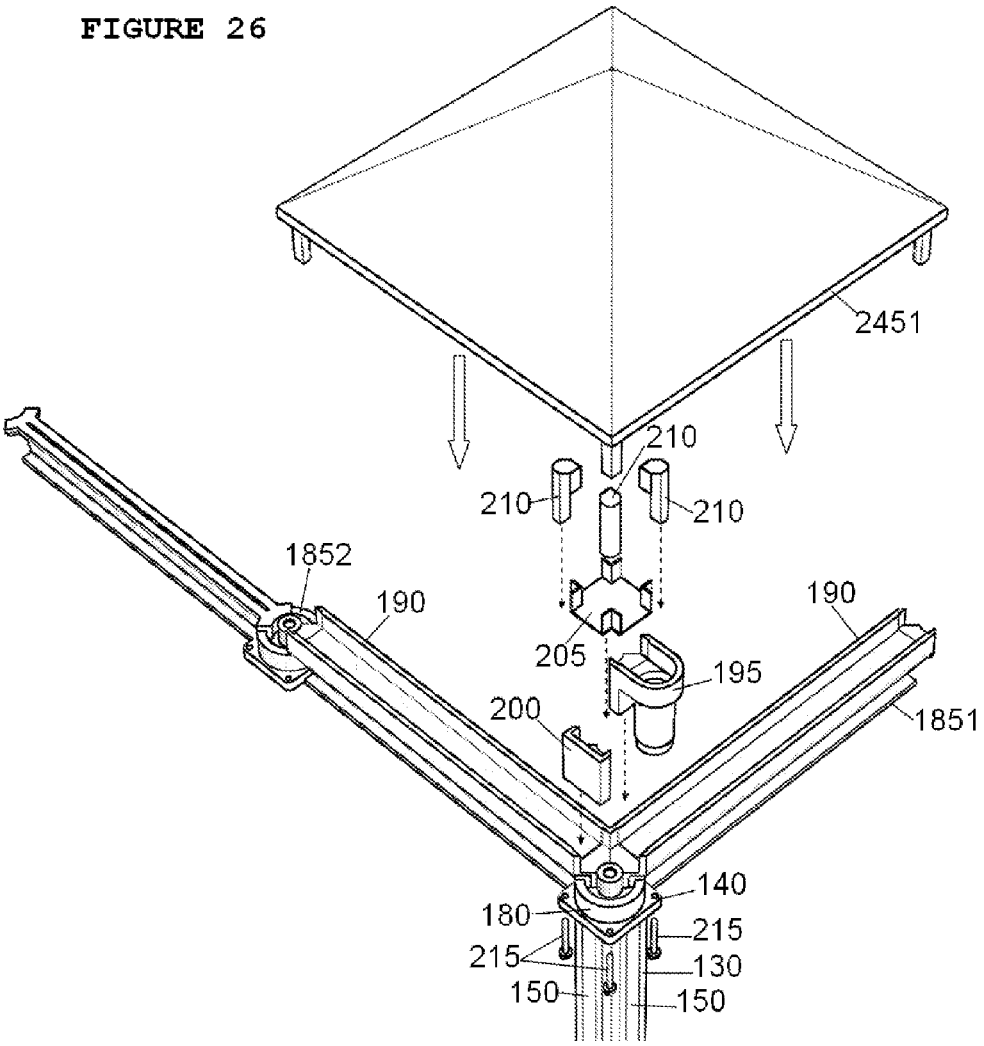


FIGURE 25

FIGURE 26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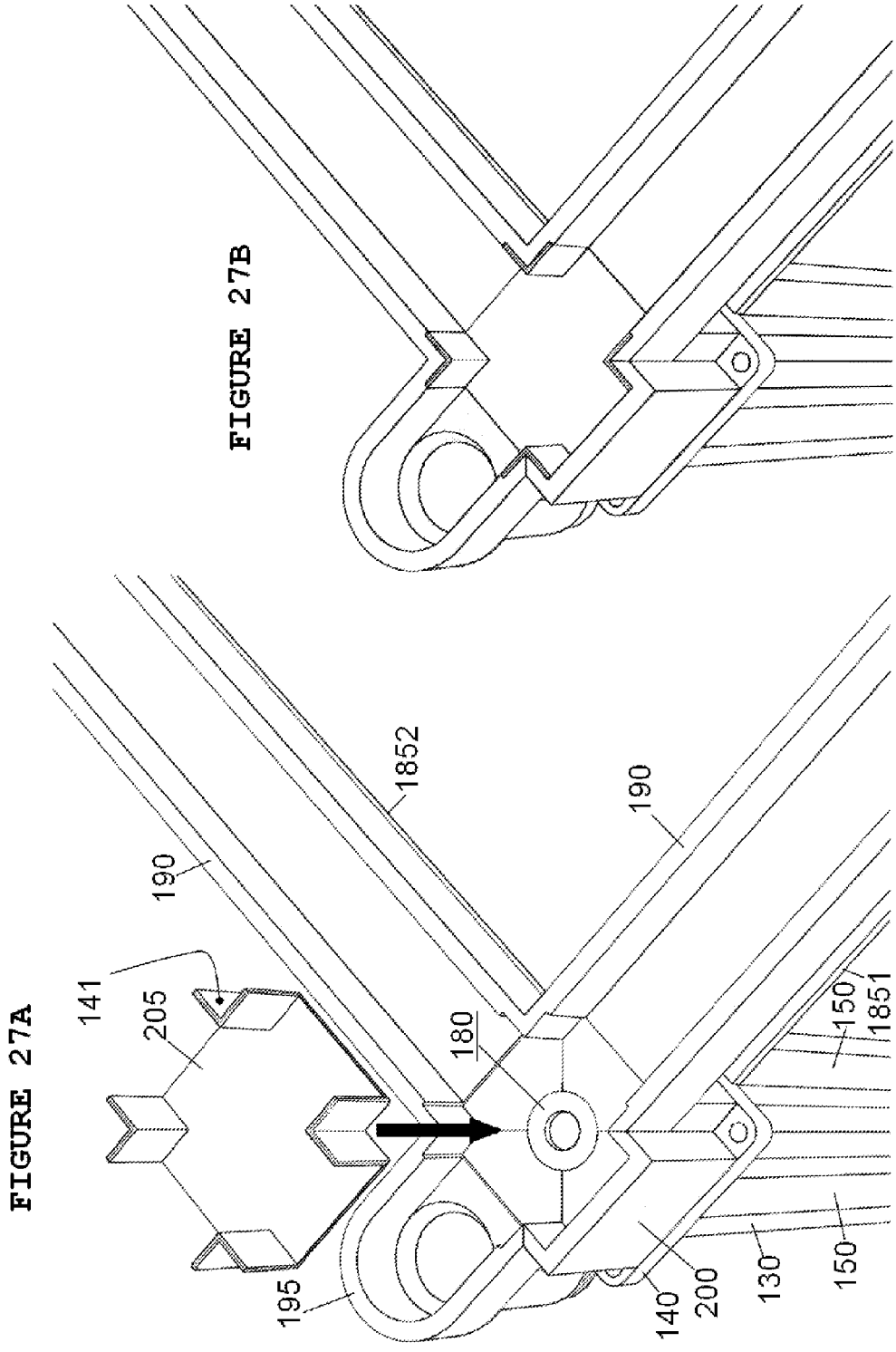
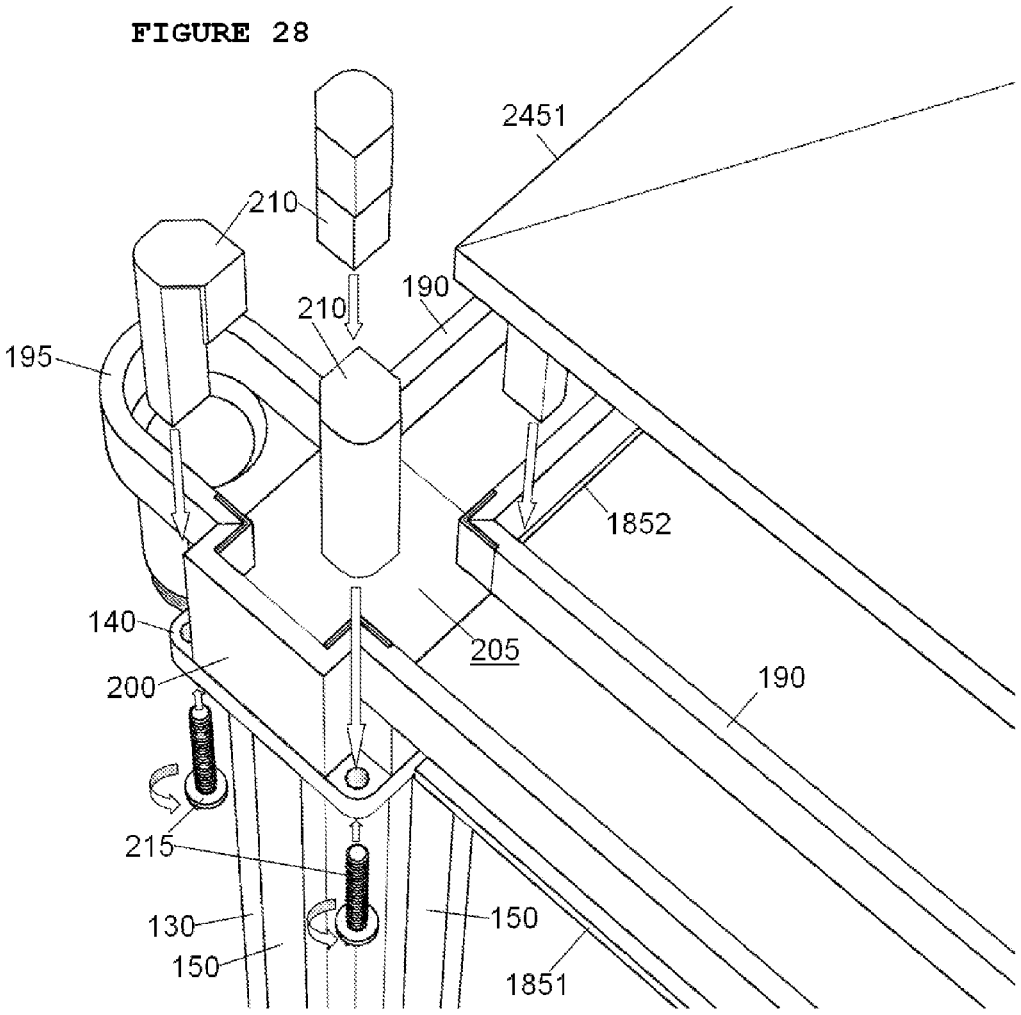
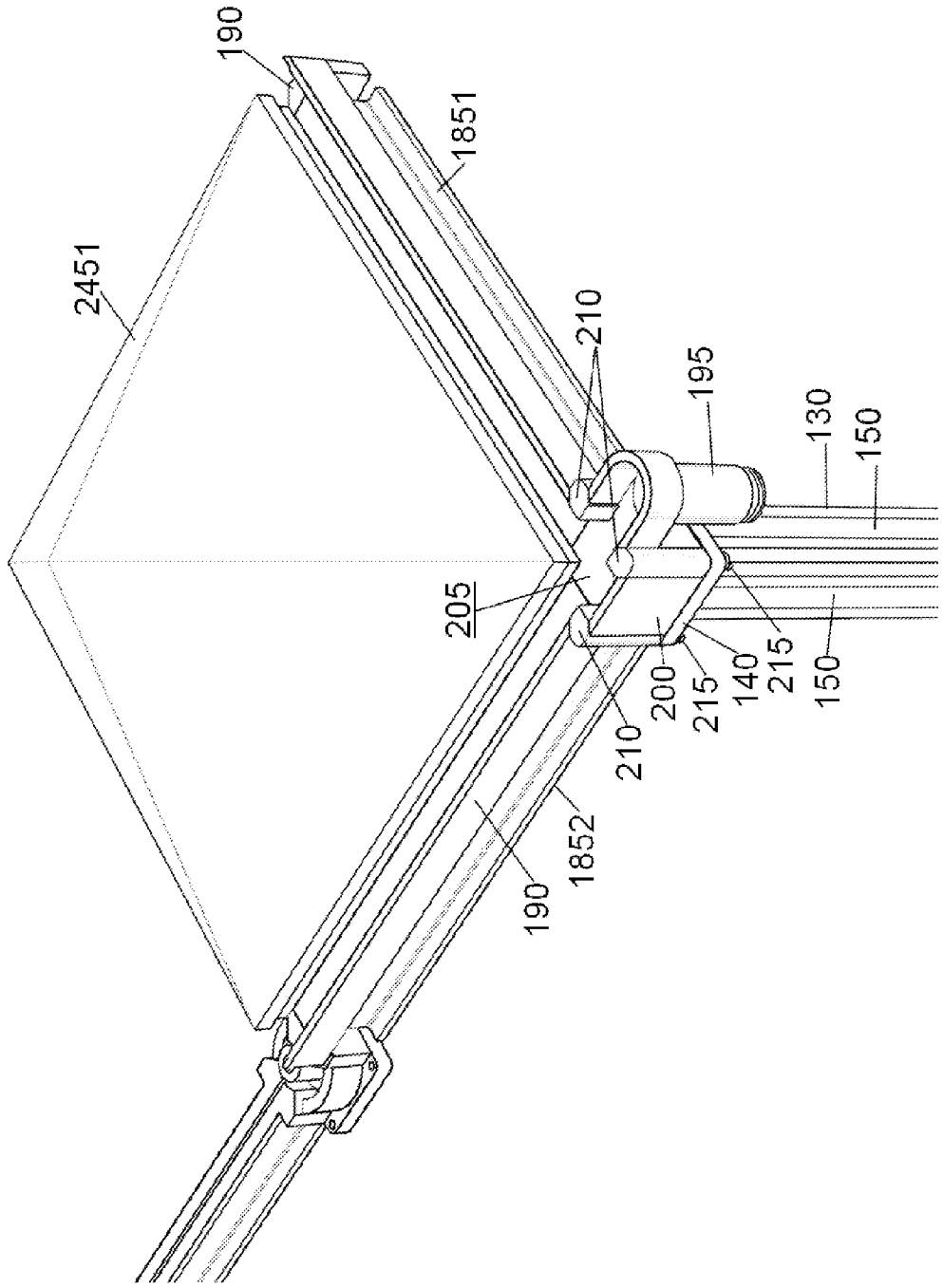


FIGURE 27A

FIGURE 27B

FIGURE 28

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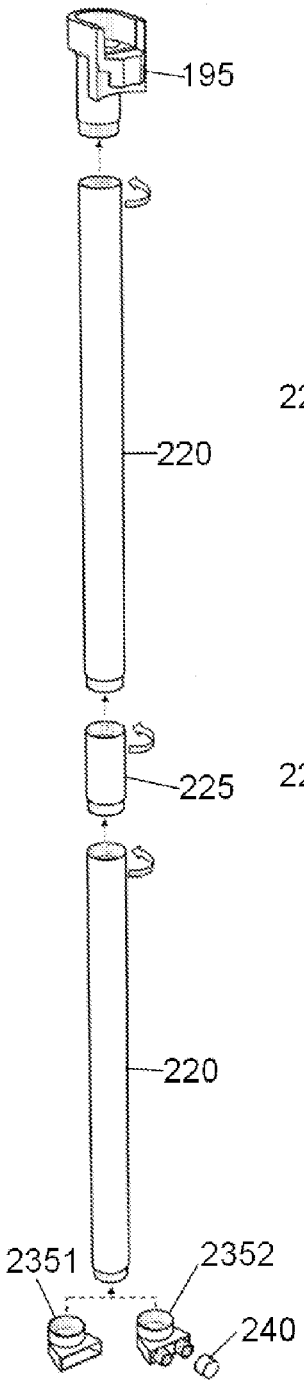
210
1852
190

FIGURE 29

FIGURE 30A FIGURE 30B



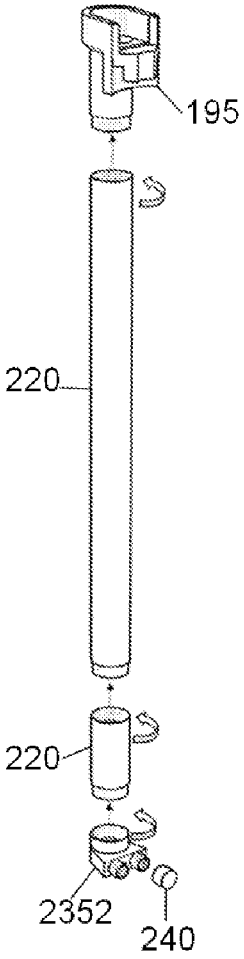
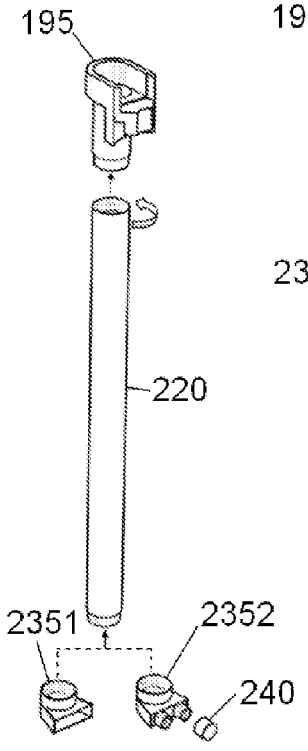


FIGURE 30C FIGURE 30D



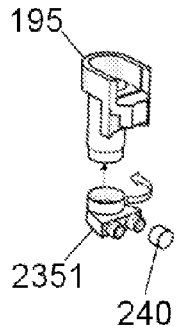


FIGURE 31

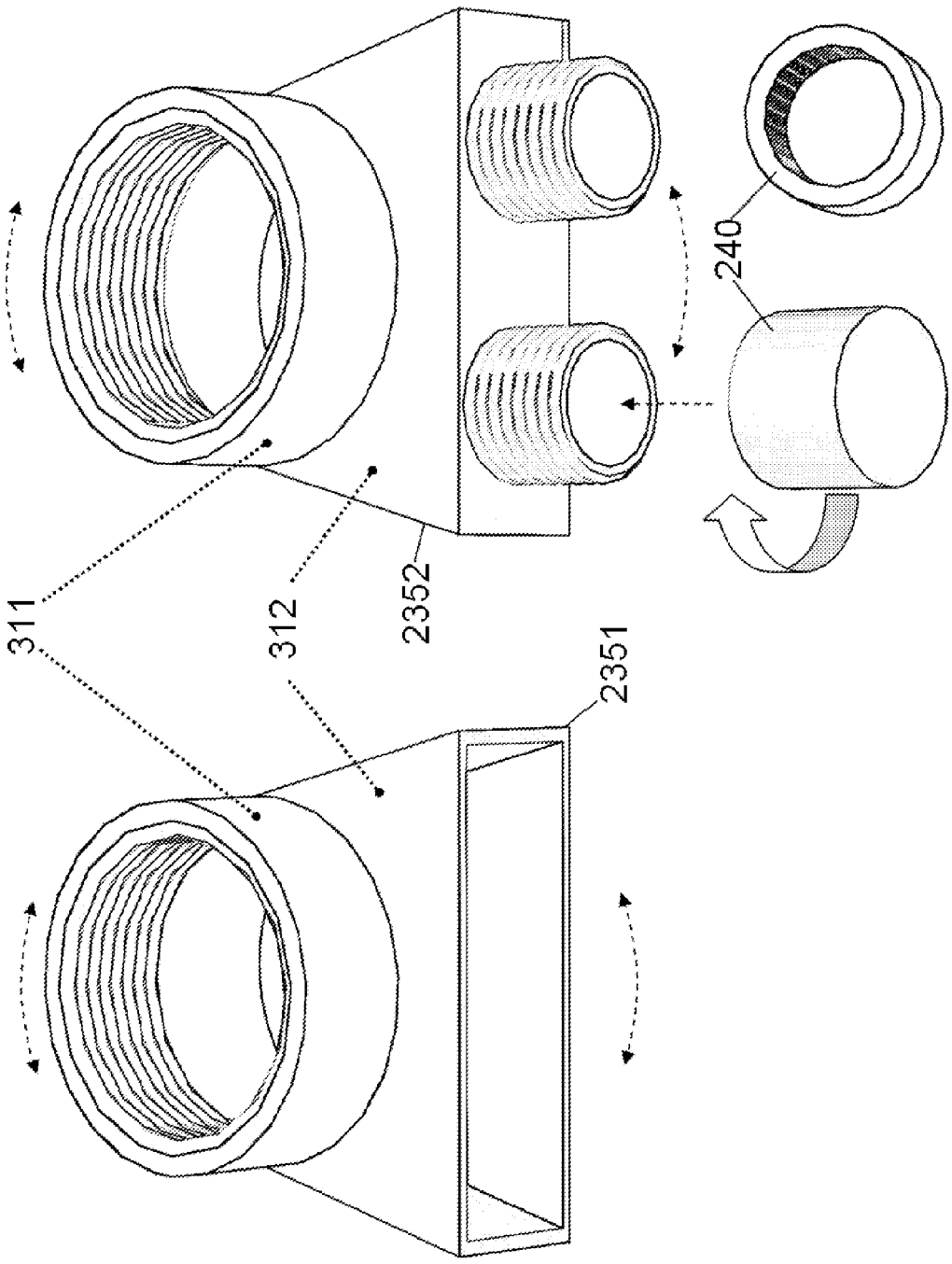


FIGURE 32A

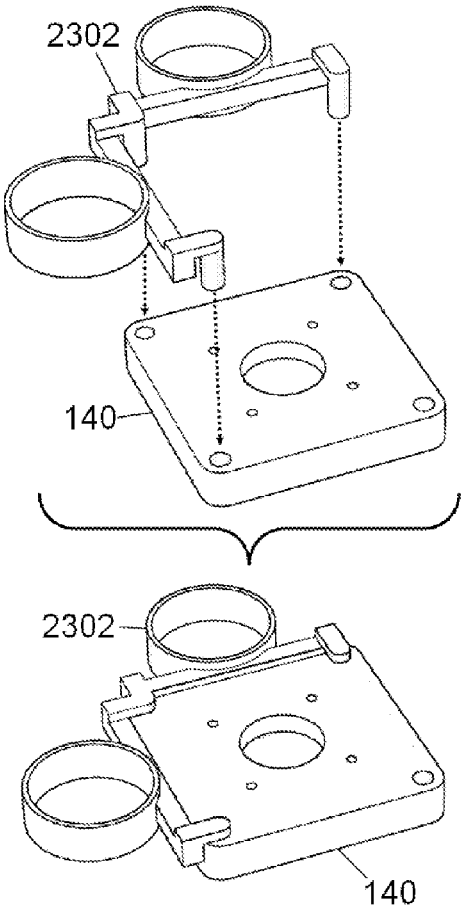
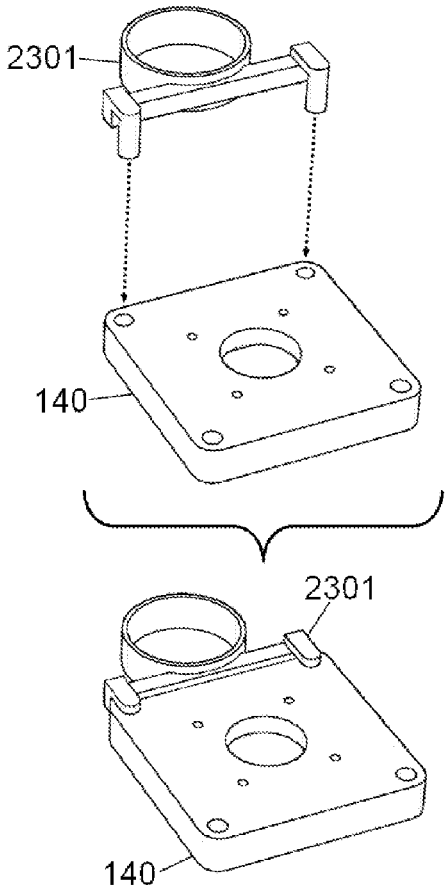


FIGURE 32B



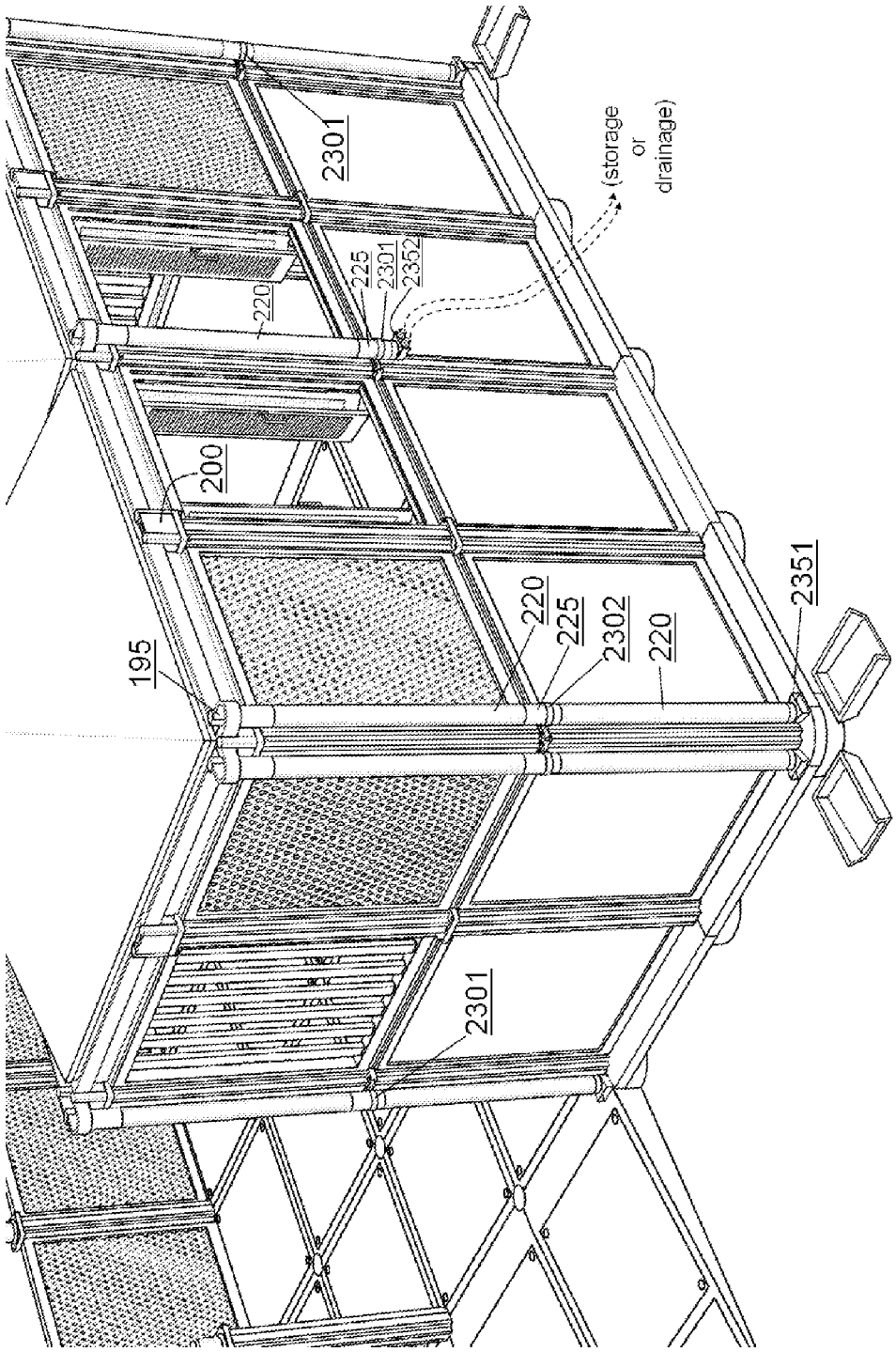
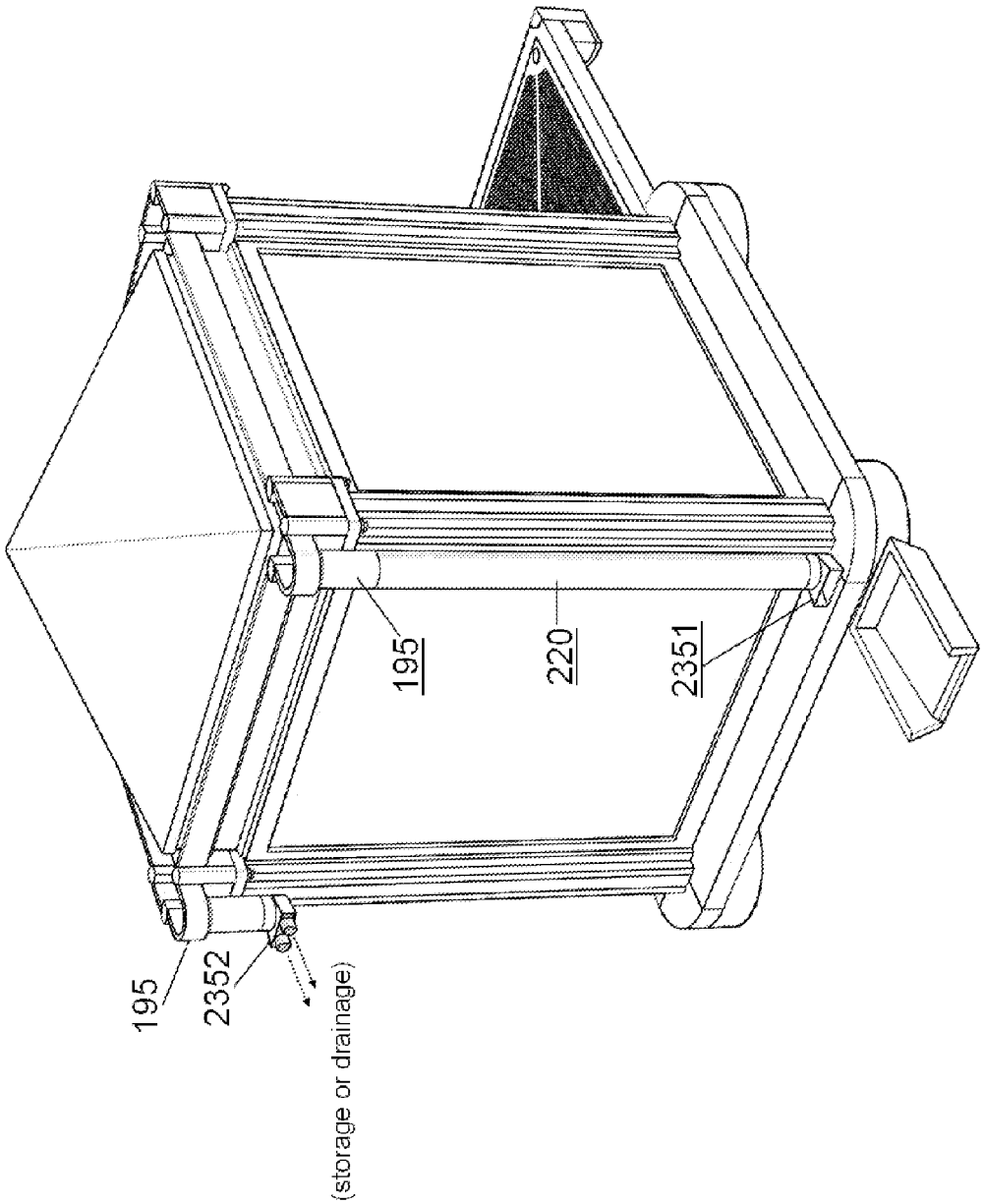

2301
(storage or drainage)
220
225
2301
2352
200
195
220
225
2302
220
2351
2301

FIGURE 32C

FIGURE 32D



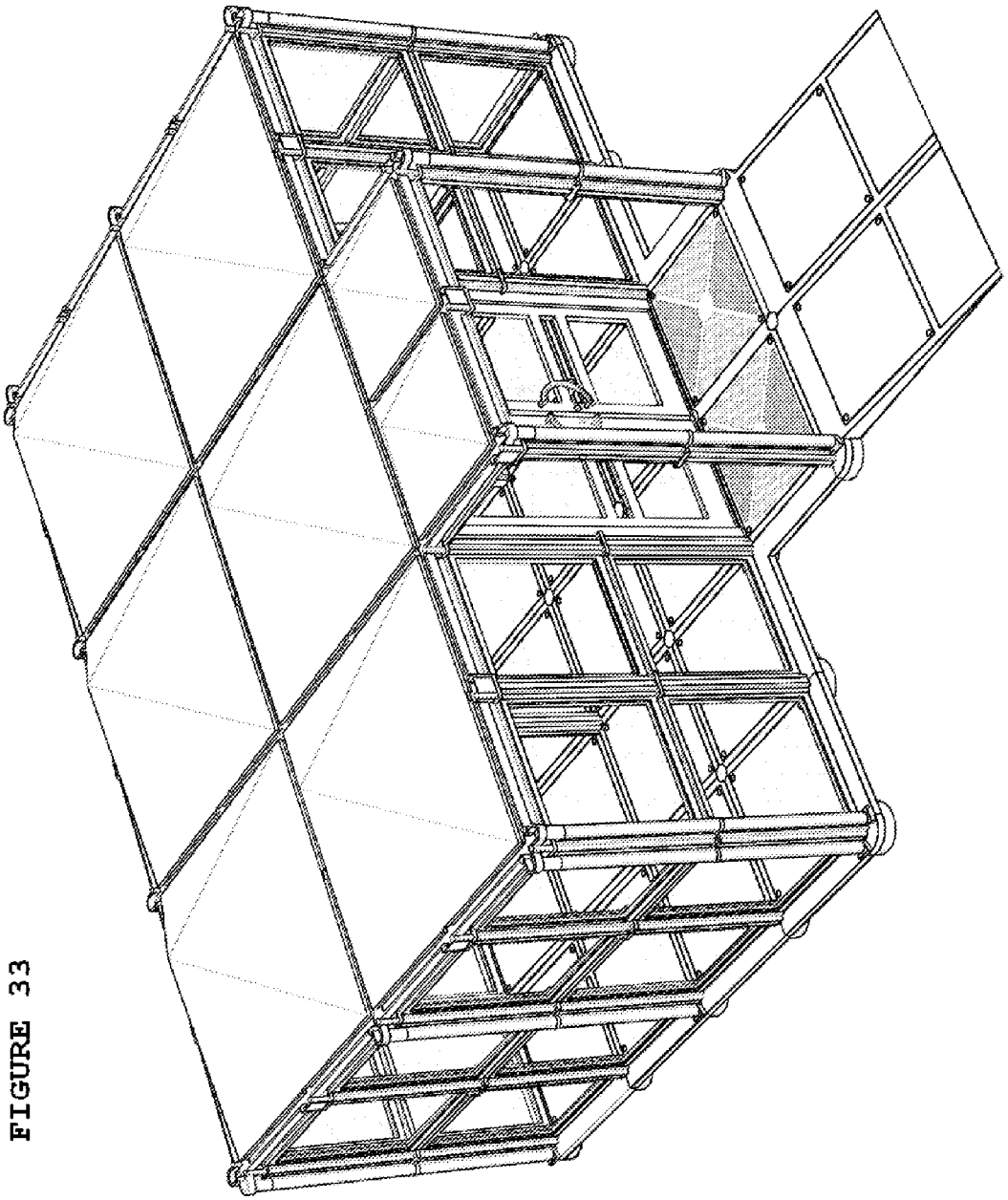


FIGURE 33

HANDMADE STRUCTURE SYSTEM

RELATED APPLICATIONS

The present application is incorporated by reference to provisional application 61/351,911, confrmation number 9568.

FIELD OF THE INVENTION

The present invention relates to the assembly of temporary or permanent structures (landscape or garden borders, enclosures, decking, walkways, platforms, sheds, cabins, shelters, mazes or other general, non-fixed configurations of variably-partitioned spaces, bulletin boards or other configurations of vertical display surfaces or barrier walls, etc.), fully or partially roofed, and/or fully or partially floored, and/or fully or partially enclosed by walls, windows, doors, or railings, indoors or outdoors, and more particularly, to assembling temporary or permanent indoor or outdoor structures (landscape or garden borders, enclosures, decking, walkways, platforms, sheds, cabins, shelters, mazes or other general, non-fixed configurations of variably-partitioned spaces, bulletin boards or other configurations of vertical display surfaces or barrier walls, etc.) fully or partially roofed, and/or fully or partially floored, and/or fully or partially enclosed by walls, windows, doors, or railings, without requiring the use of any tools other than human hands for assembly. The final configuration of structures or assemblies is accomplished by using different combinations and quantities of components from the present invention, which is a system of integrated structural components collectively referred to, described, and defined herein as the Handmade Structure System.

BACKGROUND OF THE INVENTION

The building of structures or assemblies for recreational or utility purposes (decks, walkways, platforms, shelters, bulletin board displays, sheds, mazes, etc.) traditionally requires the person building the structure to have at least moderate carpentry and construction skills. In addition, tools and materials such as hammers, nails, screws and screwdrivers, saws, etc., are required. Depending on the size and scale of the project, it also can be necessary to dig holes or trenches for a foundation, mix and pour cement for that foundation (or buy concrete pre-mixed, and pay delivery charges), then, upon completion of the task, remove the resultant spoils and unused (wasted) construction materials. All of these require significant physical effort, are time-consuming, and of significant expense. Adding railings to such structures or assemblies, or wall-height partitions for privacy and/or security, and partially or fully roofing such structures or assemblies adds to the effort, complexity, and expense.

One previous attempt to achieve some of the benefits of a systematized approach is disclosed in U.S. Pat. No. 6,209,267 to Dantzer, described as a modular decking system for use in constructing a square or rectangular deck of the type normally attached to a house or other dwelling. It makes use of mostly precut or possibly preassembled components such as rectangular base frames and floor panels, in conjunction with certain commercial off-the-shelf building/construction components, such as nails, metal connecting brackets, screws, bolts, etc., to connect the deck components into a square or rectangular shape, and connect the overall deck to a house or other building. Railings are installed via shaped wooden posts attached by bolts, screws, or nails, at outside edge framing junctions and corners. These posts have vertical slots for the installation of railing panels, and holes bored vertically into the top, to accept finishing caps bolted into these vertical bored holes. The railing panels slide vertically down into the vertical slots in the posts. The outside periphery of the floor surface is finished by attaching finished lumber boards. The Dantzer patent also describes a foundation system that utilizes posts resting on concrete foundation blocks, or, alternatively, foundation components that are mounted either in a commercially available bracket-and-spike combination driven into the ground, or in a bracket and anchor combination which is set in concrete.

Unfortunately, the Decking System of Dantzer still makes use of nails, screws, bolts, etc., for connecting the components. In addition, not all components are precut or preassembled, which means that some cutting of components and/or materials would be necessary. All this would require the use of tools and materials such as hammers, nails, screws, screwdrivers, saws, nuts and bolts, etc.

In addition, the components of the Decking System of Dantzer are oriented to square or rectangular decks, rather than irregular or custom shapes, including open areas inside the outer periphery of the overall structure or assembly.

Also, the Dantzer design allows only for the installation of fence-height railings, while the present invention enables a second, higher level of panels to be installed, allowing for the creation of true privacy walls. The Dantzer design does not allow the installation of railings or partitions anywhere except at the edge of the deck, therefore there is no provision for partitioning the surface space or spaces inside the periphery of the deck. The present invention allows the installation of posts at any junction of Floor Panels or corner of a single Floor Panel, and these posts, in conjunction with Post Brackets, make it possible to install fence or wall-height panels at variable locations, thereby allowing interior space or spaces to be partitioned into separate areas.

The Dantzer system also makes no provision for roofing an assembled structure, either partially or completely.

Another disadvantage of the Dantzer system is that removal or disassembly of the Dantzer design would be difficult, if not impossible, without damaging or destroying at least some of the components or materials. An additional removal disadvantage is that if the foundation had been installed into concrete, heavy tools and effort would be required to break up the concrete to completely remove the structure. The present invention does not make any use of concrete footings or foundations, and can be removed using the same means, and virtually the same effort, as that used to assemble it, with minimal cosmetic repair work to the site necessary after removal.

It is another object of the invention to eliminate any necessity for tools of any kind, other than human hands, to assemble the various combinations of components comprising this invention.

It is another object of the invention to reduce, if not eliminate, any necessity for foundation excavation or construction.

It is another object of the invention to allow either indoor or outdoor structures of various plans or configurations by using various combinations of components from the set of components comprising this invention.

It is another object of the invention to eliminate wastage of building materials, by allowing precise pre-planning of component requirements.

It is another object of the invention to allow the partitioning of the interior horizontal surface space(s) of a structure or assembly into separated areas.

It is another object of the invention to allow the disassembly and removal of any structure previously assembled from

the components of this invention, by the same means used to accomplish the original assembly.

It is another object of the invention to allow an assembled structure to be fully or partially enclosed, partitioned, and/or roofed, regardless of structure configuration or floor plan.

It is another object of this invention to allow flexibility in the final configuration of any structure produced by using different combinations of the components comprising this invention, including the ability to partially or completely surround, within the periphery of the structure or assembly, physical objects, areas, or features in, or planned for, the installation area (trees or other plantings, water features, other structures or assemblies, etc., or just open, unoccupied areas).

BRIEF DESCRIPTION OF THE DRAWINGS

A complete understanding of the present invention may be obtained by reference to the accompanying drawings, when considered in conjunction with the subsequent, detailed description, in which:

FIG. **1** is a front perspective view of an example structure.

FIG. **2** is a front perspective view of the non-roofing subset of components;

FIG. **3**A is a perspective view of a full-junction "basic" floor panel frame connector.

FIG. **3**B is a perspective view of an "inside corner" "basic" floor panel frame connector.

FIG. **3**C is a perspective view of a "side" "basic", floor panel frame connector.

FIG. **3**D is a perspective view of an "outside corner" "basic", floor panel frame connector.

FIG. **3**E is a perspective view of a "post" configuration floor panel frame connector. It is identical to the "full-junction" simple floor panel frame connector, but with the following additional features: 1) the hole in the center of the central column is threaded to its full depth; 2) there are four small smooth-bore holes in the top surface of the central column; 3) the entire periphery of the base is surrounded by a vertically-extending sidewall.

FIG. **4**A is a front perspective view of an anchor component, shown in two possible shaft lengths to indicate the variability of the shaft length, to meet varying foundation depth requirements in different geographic locales;

FIG. **4**B is a front perspective view of a floor panel frame component, shown both inverted (**41**) and in its installation orientation;

FIG. **5**A is an "exploded" perspective view, from above, of a single floor panel frame assembly, with an anchor component in its installation position, if it were to be used;

FIG. **5**B is an "exploded" perspective view, from below, of a single floor panel frame assembly, with an anchor component in its installation position, if it were to be used;

FIG. **6**A is a perspective detail view of a floor panel latch in position to be inserted through one of the recessed slots in each corner of a floor panel; one latch at each corner of a floor panel secures a floor panel to a floor panel frame. Also shown is a floor panel latch cap, in its installation orientation and position, as well as inverted (**61**) to illustrate that it is shaped to fit down into, as well as cover, the floor panel latch;

FIG. **6**B is a perspective detail view of the floor panel latch illustrated in FIG. **6**A after it has been inserted. The inserted latch is then rotated ninety degrees clockwise to secure the corner of the floor panel in place;

FIG. **7**A is the first in a series of four (**7**A-**7**D) top perspective views of a floor panel latch being installed into one "latch chamber" **71** inside the "body" of the floor panel frame at each of the four corners. The floor panel is not shown in this view, for visual clarity.

FIG. **7**B (second in the above-mentioned series) is a perspective detail view of the floor panel latch inserted in view **7**A, with a portion of the corner recess of the floor panel frame shown as if transparent, with the edge-lines of the receiving slot and latch chamber **71** outlined to illustrate the shape and location of the latch chamber **71**.

FIG. **7**C (third in the above-mentioned series) is a perspective detail view of the floor panel latch fully inserted through the slot and into the latch chamber **71**, with the arrow indicating the direction the latch will be rotated.

FIG. **7**D (fourth in the above-mentioned series) is a perspective detail view of the now-rotated floor panel latch shown in FIG. **7**C.

FIG. **8** is an elevated front perspective view of a ramp component, shown both inverted (**81**) and upright (**82**);

FIG. **9** is an exploded perspective view, and a combined or assembled view, of an example assembly of floor panel frame components in a square configuration.

FIG. **10** is a front perspective view of half-height and full-height post components (this use of "half-height" and "full-height" should not be considered as limiting post components to the lengths shown; other lengths are possible), illustrating both lengths (**1251** and **1252**), the threaded outer base (**101**) and center hole (**102**), which is threaded at the top of both heights of posts.

FIG. **11** is a top perspective view of a "post" configuration (**1055**) floor panel frame connector, configured to accept the externally-threaded end of a post component;

FIGS. **12**A through **12**D illustrate edge framing sections, intended to be used to fill quadrants of "post" configuration floor panel frame connectors (**1055**) not filled by floor panel frames, to prevent accrual of water, debris, etc., in those otherwise unfilled quadrants.

FIG. **12**A is a top perspective view of a "side" edge framing section component, shown both upright and inverted (**122**);

FIG. **12**B is a top perspective view of an "outside corner" edge framing section component, shown both upright and inverted (**121**);

FIG. **12**C is a top perspective view of an "inside corner" edge framing section component, shown both upright and inverted (**123**);

FIG. **12**D is a top perspective view of a U-shaped edge framing section component, shown both upright and inverted (**124**);

FIG. **12**E is a top perspective view of a "square" edge framing section component, shown both upright and inverted (**125**);

FIG. **13** is a perspective combined exploded and assembled view of an example "outside" corner assembly of flooring being finished by edge framing section components installed to a "post" floor panel frame connector;

FIG. **14**A is a horizontal perspective view of a post bracket, with dowels extending from the bottom surface of the post bracket; there is a layer of gasketing material or compound applied to the bottom surface of the post bracket;

FIG. **14**B is a perspective view of a post bracket in position to be installed into a "post" configuration floor panel frame connector, illustrating the positional relationship between the dowels and the four small smooth-bore holes in the top surface of the center column of the "post" floor panel frame connector. A post is not shown in this view, for visual clarity;

FIG. **15**A is an exploded front perspective view of an example partition panel assembly. Partition panel assemblies,

either stand-alone or as part of a larger or more extensive structure, may be half-height or full-height, or variable combinations thereof;

FIG. **15**B is a combined from-above and from-below perspective detail view of the mid-point connection between the lower and upper post brackets of the full-height portion of the example assembly shown in FIG. **15**A, illustrating the positional relationship between the dowels of the post bracket and the receiving holes in the post bracket cap;

FIG. **15**D is a perspective view of the partition panel connector, if used, in its relative installation point between upper and lower partition panels. The entire bottom surface of the partition panel frame, including the concavity, and the end surfaces of the partition panel connector, is covered by a layer of the same gasketing compound or material as that applied to the end surfaces of the partition panel connector;

FIG. **15**E is an end-on perspective view of the partition panel connector in its relative installation point, as shown in FIG. **15**D, between upper and lower partition panels. This view further illustrates the concavity in the bottom surface of the partition panel frame shown in FIG. **15**D;

FIG. **16** is a top perspective view of a post assembly top junction, either half-height or full-height, and the partitioning and post-top components that can be installed to that junction, specifically, a post bracket cap and either a finial or a post bracket;

FIG. **17** is a perspective view of a subset of the complete set of system components, with the shown subset used to assemble roofing.

FIG. **18**A is a from-above exploded perspective view, and an assembled perspective view, of an integrated gutter component and a "single" roof beam, in their relative installation positions, indicating the channel (**181**) intended to accept the bottom-surface tab (**182**) shown in FIG. **18**Bof the integrated gutter section;

FIG. **18**B is a from-below exploded perspective view, and an assembled perspective view, of an integrated gutter component and a "single" roof beam, in their relative installation positions, indicating the tab (**182**) intended to fit into the channel (**181**) of the roof beam, shown in FIG. **18**A;

FIGS. **18**C through **18**E show examples of the interconnecting and interlocking forms of roof beams, downspouts, integrated gutter sections, and gutter block components, being installed to a roof bracket;

FIG. **19** is a top and bottom perspective view of a double roof beam, shown both inverted (**192**) and upright. A "double" roof beam is functionally equivalent to a roof bracket installed over a post bracket cap, with two single roof beams installed end-to-end into the roof bracket, but produced as a single unified component. Note the square receptacle (**191**) in the bottom center surface of the roof beam; this receptacle will receive the tab (**22**) in the top center of a double-width, full-height partition panel frame (**1353**);

FIG. **20** is a top and bottom perspective view of a "single" (**2451**) roof panel and a "quad" (**2452**) roof panel. A "single" roof panel covers the surface area of a flooring assembly of one floor panel frame, while a "quad" roof panel covers the surface area of a flooring assembly of four floor panel frames assembled in a two-by-two, square configuration.

FIG. **21**A is a combined top and bottom perspective detail view of a corner connection point of both "single" and "quad" roof panel components. It illustrates the threaded holes (**212**) in the posts at each corner of both sizes (**2451**/**2452**), the continuous channel (**211**) at the periphery of both sizes of roof panels;

FIG. **21**B is an inverted perspective detail view of one side middle connection point of a "quad" roof panel. It illustrates the change in the shape of the continuous channel at the midpoint of each of the four sides of the "quad" roof panel to allow installation to a gutter block component at this point on all four sides, and the thickened "rib" portion (**214**) of the "quad" panel surface (**214**);

FIG. **22** is a top perspective view of an installed junction seal component. It is installed at any junction of any combination of integrated gutter sections, downspouts, and gutter blocks, to cover and seal the seams between those components. The junction seal has a layer of gasketing material or compound (**141**) on every surface that comes in contact with other roofing components installed at the junction. In this particular example, the installation is at the midpoint of a "double" roof beam;

FIG. **23**A is a bottom perspective detail view of the side midpoint connection location of a "quad" roof panel being installed to the midpoint of a "double" roof beam. Again, note the square receptacle (**191**);

FIG. **23**B is a bottom perspective detail view of the side midpoint connection location of a "quad" roof panel after being installed to the midpoint of a "double" roof beam. Note that the threaded holes of the roof panel post elements align with the corner holes of the post bracket cap element of the double roof beam.

FIG. **24**A is an inverted perspective view of the remaining roofing components from the subset of roofing components shown in FIG. **17**, specifically the roofing clamp, junction seal, roofing bolt, downspout, and gutter block;

FIG. **24**B is a perspective view of the remaining roofing components from the subset of roofing components shown in FIG. **17**, specifically the roofing clamp, junction seal, roofing bolt, downspout, and gutter block, shown here in their upright installation orientations.

FIGS. **25** through **29**A are a progressive series of figures illustrating the procedure of installing roofing components at a visually-isolated junction of components at the top of a post assembly, either half-height or full-height;

FIG. **25** is a front exploded perspective view of an example corner assembly of supporting and connecting components for a roof panel installation;

FIG. **26** is an elevated front perspective view of the same example corner assembly in FIG. **25**, showing the relative installation positions of precipitation-conveying and sealing components;

FIG. **27**A is an elevated front perspective detail view of the installation of a junction seal component onto the junction of precipitation-conveying components installed at this example junction assembly; note the gasketing compound or material (**141**) on those surfaces of the junction seal component that cover the seams between the other components at this example junction of roofing components;

FIG. **27**B is an elevated front perspective detail view of the now-installed junction seal component shown in FIG. **27**A.

FIG. **28** is an exploded front perspective view of the relative installation positions of the final connecting and sealing components at this example junction;

FIG. **29**A is an elevated front perspective view of the completed example corner installation of roofing components shown in FIGS. **25** through **28**;

FIGS. **30**A through **30**D are exploded perspective views of four typical, but different, combinations of downspout, downspout pipe, downspout pipe extension, and water fitting components. These combinations vary depending on the height of the post assembly to which they are installed, and the final disposition of the water conveyed via the various assemblies.

FIG. **30**A is an exploded perspective view of an assembly that could be installed to a full-height post assembly, to con-

vey water to a point near ground-level, and then either disperse that water onto the ground via a "dispersal" water fitting, or connect to an external, possibly underground, storage or drainage system via a "harvesting" water fitting;

FIG. **30**B is an exploded perspective view of an assembly that could be installed to a full-height post assembly, to connect to an external above-ground storage system or container via a "harvesting" water fitting.

FIG. **30**C is an exploded perspective view of an assembly that could be installed to a half-height post assembly to convey water to a point near ground-level, and then either disperse that water onto the ground via a "dispersal" water fitting, or connect to an external storage or drainage system via, possibly underground, via a "harvesting" water fitting.

FIG. **30**D is an exploded perspective view of an assembly that could be installed to a half-height post assembly, to connect to an external above-ground storage system or container, via a "harvesting" water fitting.

FIG. **31** is a front perspective view of a "dispersal" water fitting (**2351**), and a "harvesting" water fitting (**2352**). The top portion (**311**) of both configurations rotate freely and independently of the bottom portion (**312**), like the threaded coupling of a standard garden hose, as indicated by the directional-movement arrows;

FIG. **32**A is a combined exploded and installed perspective view of the "corner" configuration of downspout pipe stabilizer, shown in its installation position relative to the post bracket cap into which it would be installed, with a view of the downspout pipe stabilizer component after installation;

FIG. **32**B is a combined exploded and installed perspective view of the "side" configuration of downspout pipe stabilizer, shown in its installation position relative to the post bracket cap into which it would be installed, with a view of the downspout pipe stabilizer component after installation;

FIG. **32**C is a perspective view of the full-height portion of an example structure, illustrating the downspout and pipe assemblies of FIG. **30**A and FIG. **30**B with the downspout pipe stabilizers in their installed locations, and also indicating the variable locations at which the assemblies may be installed, including two FIG. **30**A assemblies immediately adjacent to each other at the near corner of the structure;

FIG. **32**D is a perspective view of a half-height example structure, illustrating the downspout and pipe assemblies of FIG. **30**C and FIG. **30**D installed to a half-height structure;

FIG. **33** is an elevated front perspective view of an example fully-enclosed and roofed structure.

For purposes of clarity and brevity, like elements and components will bear the same designations and numbering throughout the Figures.

DESCRIPTION OF THE PREFERRED EMBODIMENT

While the present invention is capable of embodiment in an almost unlimited variety of structural forms in both extent and configuration, there is shown in the drawings, and will hereinafter be described, various embodiments of structures and structural assemblies, with the understanding that the present disclosure is to be considered an exemplification of the invention's capabilities, and is not intended to limit the invention to the specific embodiments illustrated.

FIG. **1** is a front perspective view of an example un-roofed structure being assembled. It illustrates one possible configuration of a structure that can be assembled using a subset of components, with some of those components indicated in their relative positions for installation, and some in their installed positions.

FIG. **2** is a front perspective view of a non-roofing subset of components. Combinations of these components, in varying numbers depending on the size and configuration of the desired structure, allow the assembly of unroofed structures of any desired or required size or configuration. Not every structure would require all of the components shown, and any structure or assembly constructed using this subset of components could then be partially or fully roofed.

FIGS. **3**A through **3**E are views of the five different configurations of floor panel frame connectors **1051** through **1055**. Each is configured as one to four "quadrants" of a full circle; configuration **1051** shown in FIG. **3**D is one quadrant, configuration **1052** shown in FIG. **3**C is two (2) adjacent "quadrants", configuration **1053** shown in FIG. **3**B is three (3) adjacent "quadrants, and configuration **1054** shown in FIG. **3**A is all four "quadrants" of a circle. Configurations **1051**, **1052**, **1053** and **1054** are "basic" configurations, used when no Post **1251-1252** components are to be installed at the junction of two or more Floor Panel Frame **100** components, or at one or more corners of a single Floor Panel Frame **100** assembly. Configuration **1055** is a "post" configuration, used when a post **1251-1252** will be installed, or may be installed at the junction of two or more Floor Panel Frame **100** components, or at one or more corners of a single Floor Panel Frame **100** assembly. A "post" connector **1055** does not require that a post **1251-1252** be installed into it. Precise positioning of all floor panel frame connectors **1051-1052-1053-1054-1055** before installing floor panel frames **100** is not required, as individual connectors may be positionally adjusted as a floor panel frame **100** is installed.

Both the "post" **1055** configuration connector and the full-junction "Basic" connector **1054** can accept a Junction Cap **160**. The Junction Cap **160** is installed into the central column of a "post" configuration Floor Panel Frame Connector **1055** when no Post **1251-1252** is installed into the "post" configuration connector **1055**. A Junction Cap **160** is installed into the central column of a full-junction "Basic" connector **1054** when both "Basic" and "post" **1055** configuration connectors are used in a structure, to allow visual consistency in their finished appearance. The shorter columns **112** extending upwardly from the "floor" of all configurations of Floor Panel Frame Connector **1051-1052-1053-1054-1055** components are intended to be inserted into the holes **45** in the "legs" of Floor Panel Frame **100** components or the holes **45** in the "legs" of Edge Frame Section **1701-1702-1703-1704-1705** components, when those components are installed onto the connectors. They are equidistantly spaced in a radial pattern, two per "quadrant" of all configurations of Floor Panel Frame Connector **1051-1052-1053-1054-1055** components.

FIG. **4**A is a front perspective view of an Anchor **120** component, shown in two possible lengths to indicate the variability of the shaft **3** length. The variability in shaft **3** length of the Anchor **120** component is to allow conformity with local or regional building code requirements for foundation depth. Regardless of shaft **3** length, the configuration and dimensions of the top and bottom portions are identical. The top portion consists of a square shank **1**, to be used in drilling or screwing the Anchor **120** into the installation surface. (NOTE: The statement that no tools are required applies to assembly of components; attaching or anchoring a structure or assembly to the ground is not assembly. If a structure or assembly is constructed indoors, or even temporarily outdoors on a paved surface, anchoring would not be required, or even possible.) Immediately below the shank **1** portion of the shaft is the retaining disc **2**. This flat disc will, if and when the Anchor **120** component is fully installed, seat against the retaining shoulder or lip **44** at the inner bottom of the anchor-

ing hole in the center of a Floor Panel Frame **100**. This retaining shoulder **44** is identical to the retaining shoulder **44** visible in the anchoring hole of the Ramp **145** component illustrated in FIG. **8**. Near the bottom of the Anchor **120** shaft are tines **4**, shown here as inclined three-quarter discs. These tines **4** could also be helical in shape, similar in configuration to the tines used for heavy-duty tent stakes. The Anchor **120** component is a situational component for attaching outdoor structure assemblies to the installation surface when required or desired, and would not be used for indoor assemblies, or required for temporary assemblies on outdoor surfaces.

FIG. **4**B shows the Floor Panel Frame **100** component that is the basic assembly and supporting unit of any floored structure. It is shown in an inverted view **41**, and its upright, installation orientation. It is square, with four supporting "legs", one at each corner. These legs are shaped to fit onto one "quadrant" of a floor panel frame connector **1051-1052-1053-1054-1055**. In the bottom surface of each "leg" are two holes **45**. The depth of these holes **45** is equal to the length, or height, of the two round columns **112** projecting upward from each "quadrant" of all Floor Panel Frame Connector **1051-1052-1053-1054-1055** components. The top center surface portion of the Floor Panel Frame **100** is recessed, or "sunken", below the top-most surface of the component. This recessed space will receive a Floor Panel **110**. Diagonal cross-members extend from each inner corner of the recessed space in the top center of the Floor Panel Frame **100**, and meet at the anchoring hole **43** in the center of the Floor Panel Frame **100**. At the bottom inner edge of the anchoring hole is a retaining shoulder **44**. It is this shoulder **44** that will receive the outer edge of the retaining disc **2** of the Anchor **120** component when it is fully installed, and it is this connection point between the two components that will secure the assembly to the installation surface. The slot visible in the top surface of each inner corner of the Floor Panel Frame **100** is the entrance to a specially shaped "latch chamber" **71** located inside the body of each inner corner of the Floor Panel Frame **100**. It is this "latch chamber" **71** that will allow the Floor Panel **110**, when it is installed, to be secured to the Floor Panel Frame **100**.

FIG. **5**A is a from-below perspective view of a single Floor Panel Frame **100** assembly, with optional Anchor **120**. In this illustration, where a single Floor Panel Frame **100**, unconnected to any other Floor Panel Frame **100**, is assembled, an "outside corner" configuration of the Floor Panel Frame Connector **1051** is used. One Floor Panel Frame Connector **1051-1052-1053-1054-1055**, of a configuration appropriate to the desired structure, is required at each corner of a Floor Panel Frame **100**, whether or not it is, or will be, connected to one or more additional Floor Panel Frame **100** components. The base surface of the anchoring hole **43** at the center of the Floor Panel Frame **100** extends vertically below the level of the "legs" at the corners of the Floor Panel Frame **100**, and the installation of a Floor Panel Frame Connector **1051-1052-1053-1054-1055** at each corner is required to make the Floor Panel Frame **100** assembly sit levelly and stably on the installation surface, as well as to provide a "finished" appearance to each corner of the Floor Panel Frame **100**. The two receiving holes **45** in the bottom of each "leg" of the Floor Panel Frame **100** slide smoothly down onto and over the connector columns **112** on the inner top surface of the base of a Floor Panel Frame Connector **1051-1052-1053-1054-1055**, until firmly seated. If the assembly is to be anchored into the installation surface, the Anchor **120** component is inserted through the anchoring hole **43** in the center of the Floor Panel Frame **100**, and drilled or screwed into the installation surface until the Anchor **120** retaining disc **2** is firmly seated against the retaining shoulder **44** at the inner base of the anchoring hole, thereby solidly securing the Floor Panel Frame **100** and Floor Panel Frame Connector **105** components to the installation surface. A Floor Panel **110** is inserted vertically down into the recessed space in the top center of the Floor Panel Frame **100**. The diagonal channels and round center recess in the bottom surface of the Floor Panel **110** fit down over and onto the cross-members and top surface of the anchoring hole **43** until they are firmly seated. These shaped and recessed spaces prevent lateral movement of the Floor Panel **110** when installed. The top surface of the installed Floor Panel **110** is flush with the top surface of the Floor Panel Frame **100** and the top surface of the Floor Panel Frame Connector **105**. The Floor Panel **110** will be secured to the Floor Panel Frame **100** by installing a Floor Panel Latch **115** at each corner.

FIG. **5**B is a from-below perspective view of the same assembly shown in FIG. **5**A.

FIGS. **6**A and **6**B are combined front perspective views of a Floor Panel **110** being secured to a Floor Panel Frame **100** by a Floor Panel Latch **115**, also illustrating a Floor Panel Latch Cap **165**. The Floor Panel **110** has one (1) recessed hole in each corner. The top half of this hole is round, large enough and deep enough to allow the round top portion of the Floor Panel Latch **115** to fit snugly but smoothly inside, with the surface of the installed Floor Panel Latch **115** flush with the top surface of the Floor Panel **110**. The bottom half of the hole is a rectangular slot or channel cutting through the remaining thickness of the Floor Panel **110**, to allow the T-shaped flange of the Floor Panel Latch **115** to pass through the Floor Panel **110** into a corresponding rectangular slot in the Floor Panel Frame **100**. The top recessed surface of the Floor Panel Latch **115** is shaped with a raised cross-bar to allow the installer's fingers to be used to rotate the Floor Panel Latch **115** when it is installed. Also illustrated is the Floor Panel Latch Cap **165**, shown in an inverted view **61**, as well as its installation orientation. This component, of some flexible and water-resistant natural or synthetic material, is shaped to fit down over and into the top surface of the Floor Panel Latch **115**, protecting it from the weather, and also providing a visually "finished" appearance. FIG. **6**A shows the Floor Panel Latch **115** in position to be installed, while FIG. **6**B shows the Floor panel Latch **115** installed, but prior to being rotated.

FIGS. **7**A through **7**D are top perspective progressive-series views of a Floor Panel Latch **115** being installed into one "latch chamber" **71** inside the "body" of the Floor Panel Frame **100** at each of the four corners. In this series of views, the Floor Panel **110** that would be secured by the installation of the Floor Panel Latch **115** components is not shown for visual clarity. FIG. **7**A illustrates the Floor Panel Latch **115** in position to be inserted into the channel, or slot, at the top of the "latch chamber" **71**. FIG. **7**B provides the same view, but with the top recessed corner surface of the Floor Panel Frame **100** shown as if partially transparent, illustrating the location and configuration of the "latch chamber" **71**. FIG. **7**C shows the Floor Panel Latch **115** fully inserted into the "latch chamber" **71**. The arrow indicates that, when fully inserted, the Floor Panel Latch **115** should be rotated clock-wise 90 degrees. FIG. **7**D shows the Floor Panel Latch **115** after having been rotated inside the "latch chamber" **71**. The T-shaped flange of the Floor Panel Latch **115** is now opposed to the slot through which it was inserted, thereby locking, or "latching", this corner of the Floor Panel **110** in place. With a Floor Panel Latch **115** installed at each corner, the Floor Panel **110** is secured in place. This view also indicates the installation of the Floor Panel Latch Cap **165**, with the shaped extrusion on the bottom side inserted into the recessed top space of the Floor Panel Latch **115**.

FIG. **8** is an elevated front perspective view of a Ramp **145** component, shown both inverted (**81**) and upright (**82**). The Ramp **145** provides an inclined surface between the installation surface and the horizontal surface of an assembled floored structure, allowing wheeled implements, objects, or vehicles to be rolled from the installation surface onto the floored surface. It has two "legs" identical in size and configuration to those supporting one side of a Floor Panel Frame **100**. These "legs" install onto a Floor Panel Frame Connector **1051-1052-1053-1054-1055** in exactly the same manner as one side of a Floor Panel Frame **100** does, thereby connecting the Ramp **145** to a larger or more extensive structure or assembly. It has a square recessed top surface space, identical in dimension and configuration to the square recessed top space in the top surface of a Floor Panel Frame **100**. This space is filled by a Floor Panel **110** identical in configuration and dimensions to the Floor Panel **110** component that is installed into a Floor Panel Frame **100**. The only difference lies in the inclination of that space from the horizontal plane of the Floor Panel Frame **100**. The top edge of the cylindrical anchoring hole at the center of this recessed space of the Ramp **145** slopes downward, but is nevertheless of sufficient depth that the square shank **1** of an Anchor **120** will lie below this sloped surface when and if an Anchor **120** component is used to attach this component to the installation surface. The end of the Ramp **145** opposite to the end that is installed to a Floor Panel Frame Connector **1051-1052-1053-1054-1055** has a solid (unperforated) surface with a textured, slip-resistant surface finish.

FIG. **9** is a combined exploded and assembled perspective view of an example assembly of Floor Panel Frame **100** components in a square configuration, and the resultant assembly after the installation. It illustrates multiple Floor Panel Frame **100** components being installed to multiple "Basic" Floor Panel Frame Connector **105** components to form a square assembly, with a Ramp **145** being installed along one side of one Floor Panel Frame **100**. Note that the configuration of Floor Panel Frame Connector **1051-1052-1053-1054** components at each junction or corner is determined by the configuration of each junction, and that this example makes use of Floor Panel Frame Connectors **1051**, **1052**, **1053**, and **1054**. The center junction, where four (4) Floor Panel Frame **100** components are joined requires a "full-junction" connector, either **1054** or **1055**; configuration **1054** is shown here. (Configuration **1055** could be substituted for any or all of the connectors shown in this view, which would then require the use of edge framing sections. "Basic" connectors allow for a simpler and, presumably, less-costly assembly.) The side junctions, where two (2) Floor Panel Frame **100** components, or a Floor Panel Frame **100** and a Ramp **145**, meet, require configuration **1052**. The point where two (2) Floor Panel Frame **100** components are joined to the Ramp **145** component in an "L" shape, requires configuration **1053**, while each peripheral corner requires configuration **1051**. It should be apparent from this example that floored structures of an almost infinite size and configuration (floor plan) can be assembled, simply by varying the number and arrangement of components.

FIG. **10** is a front perspective view of a set of half-height and full-height Post **1251-1252** components, shown both horizontally and upright. Posts **1251-1252** are necessary to provide a vertical supporting framework for the installation of Partition Panels **1351-1352-1353** and roofing components to a structure, as desired or required. Posts **1351-1352-1353** require the use of the "post" **1055** configuration of the Floor Panel Frame Connector **1051-1052-1053-1054-1055**. The half-height Post **1251** allows the installation of a single level or course of Partition Panels **1351**, thereby creating "fence"-height railings or walls, while the full-height Post **1252** allows the installation of two vertically adjacent levels or courses of Partition Panel **1351-1352-1353** components, thereby creating full-height walls. The only difference between the half-height **1251** and full-height **1252** Post **1251-1252** components is their overall length or height. Each Post **125** has a round central hole **102** throughout the entire length of the component. The top or upper portion of this hole is internally threaded to a depth sufficient to accept either a Finial **155** component, or a Roof Bracket **180** component. The shaft of the Post **1251-1252** is round, with the bottom portion externally threaded **101** to a length equal to the depth of the threaded hole in the central column of a "post" configuration Floor Panel Frame Connector **1055**.

FIG. **11** is a detail perspective view of a Floor Panel Frame Connector **1055** configured to accept the externally-threaded end **101** of a Post **1251-1252** component, as well as the "legs" of Floor Panel Frame **100** components and/or Edge Frame Section **1701-1702-1703-1704-1705** components. It is structurally equivalent to the "full junction" Basic Floor Panel Frame Connector **1054**, but with the addition of an enclosing side wall **111** around the periphery of its base, and with the hole in the central shaft **113** threaded to accept the outside threaded end **101** of either a half-height **1251** or full-height **1252** Post **1251-1252** component.

FIGS. **12**A through **12**E are perspective views of a complete set of Edge Frame Section **1701-1702-1703-1704-1705** components. Edge Frame Section **1701-1702-1703-1704-1705** components are only necessary for a structure, or portion of a structure, that has "post" configuration Floor Panel Frame Connector **1055** components installed. There are five (5) configurations of the Edge Frame Section component. Each configuration is shown both inverted (**121**, **122**, **123**, **124**, **126**) and in its upright installation orientation. Straight-sided square or rectangular structure assemblies without enclosed unfloored interior spaces require only the "side" **1072** and "outside" corner **1701** configurations of the Edge Frame Section **1701-1702-1703-1704-1705** component. The "inside corner" **1703**, "U" **1704**, and "square" **1705** configurations are necessary for structures with irregular edges or enclosed unfloored interior spaces. Edge Frame Section **1701-1702-1703-1704-1705** components may be used in various combinations to finish the periphery of a floored structure, or interior unfloored spaces in any assembled configuration, or, without flooring at all. The "legs", or corner supports, of an Edge Frame Section **1701-1702-1703-1704-1705** are identical to the "legs" of a Floor Panel Frame **100**, and install into the "post" connector configuration of a Floor Panel Frame Connector **1055** identically with the installation of a Floor Panel Frame **100**, with the receiving holes **45** sliding downwardly onto Floor Panel Frame Connector **1051-1052-1053-1054-1055** posts **112**.

FIG. **13** is a top perspective exploded and assembled series view of an example corner assembly of a Floor Panel Frame **100** and a "post" configuration of a Floor Panel Frame Connector **1055**, being finished by Edge Frame Section **1701-1702** components. One "leg" of the Floor Panel Frame **100** occupies one quadrant of the interior space of the "post" configuration connector **1055**, while the two "side" configurations **1702** and single "outside" corner configuration **1701** of the Edge Frame Section **1701-1702-1703-1704-1705** components are installed into the remaining quadrants to produce a finished appearance, and to fill the remaining three quadrants of the connector **1055**. Filling all four quadrants of the "post" configuration connector **1055** provides an effectively strong and stable support base for this junction of compo-

nents, and keeps detritus and precipitation from accumulating in the otherwise unfilled space.

FIG. **14**A is a horizontal perspective view of a Post Bracket **130**, with dowels **143** extending from the bottom surface of the Post Bracket **130**. The center smooth-bore hole of the Post Bracket **130** allows the Post Bracket **130** to be installed by sliding the Post Bracket **130** down onto a Post **1251-1252**. The Post Bracket **130** has a T-shaped channel, or "slot", on the outside of each of its four sides. These channels allow the installation of either Partition Panel **1351-1352-1353** components, one into each channel, or the installation of a Finishing Strip **150** into any channel into which a Partition Panel **1351-1352-1353** is not installed. The dowels **143** would be installed to the bottom of the Post Bracket **130** during the manufacturing process, not by the person or persons assembling a structure. The exposed, unthreaded ends of the dowels would fit down into the corresponding holes **114** in the top surface of the Floor Panel Frame Connector **1055** when the Post Bracket **130** is fully installed to the Post **1251-1252**.

FIG. **14**B shows a Post Bracket **130** in installation position, relative to a "post" configuration Floor Panel Frame Connector **1055**, illustrating the orientation of the dowels **143** of the Post Bracket **130**, relative to the receiving holes **114** in the top surface of the Floor Panel Frame Connector **1055** (the Post **1251-1252** is not shown in this view, for visual clarity). With the Post **1251-1252** fully screwed into Floor Panel Frame Connector **1055**, and the Post Bracket **130** fully inserted down over the Post **1251-1252**, and with the dowels fully inserted into their receiving holes **114** in the top surface of the Floor Panel Frame Connector **1055**, the Post Bracket **130** cannot be rotated around the Post **1251-1252** without either lifting the Post Bracket **130** high enough to remove the dowels **143** from their receiving holes, or applying horizontally-rotating force sufficient to shear off the dowels. This also will secure, rotationally, any partition panel or panels **1351-1352-1353** installed into the Post Bracket **130**.

FIG. **15**A is an exploded front perspective view of an example assembly, illustrating that partitioning of different heights may be created by combining different components, and how those different-height components would connect together. Creating more extensive assemblies would simply require installing additional components necessary to achieve the required or desired final configuration of the more extensive assembly. A half-height Post **1251** component and a full-height Post **1252** component are shown in their installation positions relative to Floor Panel Frame Connector **1055** components, although not shown inserted into the connectors. A single Post Bracket **130** has been slid down over the half-height Post **1251**, with a Post Bracket Cap **140** in its relative installation position above it. Two Post Bracket **130** components have been slid onto a full-height Post **1252**, with one Post bracket Cap **140** slid onto the full-height Post **1252** between them, and another Post Bracket Cap **140** at the top of the second upper Post Bracket **130** in its relative installation position. Above each of the top-most Post Bracket Cap **140** components are the two components that can be installed through the Post Bracket Cap **140** component into the top of either a half-height **1251** or full-height Post **1252**; these are the Finial **155**, and a Roof Bracket **180**. (Only one or the other of these two components can be installed to the top of a single Post **1251-1252**.) The Finial **155** component is used to secure a Post **1251-1252** assembly when no roofing components will be installed to a **1251-1252** assembly. The Roof Bracket **180** is used to secure the Post **1251-1252** assembly below it, while simultaneously allowing the installation of roofing components. The installation of either the Finial **155** or Roof Bracket **180** effectively secures the full Post **1251-1252** assembly, from the Floor Panel Frame Connector **1055** to the Finial **155** or Roof Bracket **180**, into a single, connected unit.

The Partition Panel **1351** components of this example assembly are installed by sliding them down into the channels on the sides of adjacent installed Post Bracket **130** components. When a second, higher course of Partition Panel **1351** components is installed to a full-height Post **1252** assembly, the bottom edge surface of the second, or higher, Partition Panel **1351** will rest on the top surfaces of the Post Bracket Cap **140** components installed at the tops of the adjacent lower installed Post Bracket **130** components. This would leave a space, or gap, between the top edge surface of the lower installed Partition Panel **1351** and the bottom edge surface of the upper installed Partition Panel **1351**. If desired, this gap can be closed by the installation of a Partition Panel Connector **175** component. This component fits down over the top edge of the lower Partition Panel **1351**, and the bottom edge of the upper Partition Panel **1351** fits down onto the upper surface of the Partition Panel Connector **175** (refer to FIGS. **15**D and **15**E), thereby closing and sealing the vertical gap between the two Partition Panel **1351** components. The horizontal length of an installed Partition Panel Connector **175** is equal to the horizontal distance between adjacent installed Post Bracket Cap **140** components, and leaves no unfilled horizontal gap between those adjacent Post Bracket Cap **140** components. The Partition Panel Connector **175** is not structurally necessary.

FIG. **15**B is a detail perspective view of the mid-point of the full-height Post **1252** assembly shown in FIG. **15**A. The dowels **143** of the upper Post Bracket **130** would be inserted into the small-diameter smooth-bore holes **142** in the top surface of the Post Bracket Cap **140**, thereby providing the same horizontally-rotational resistance to the Post Bracket **130** in this example as that provided to a Post Bracket **130** installed into a Floor Panel Frame Connector **1055**. Note the Finishing Strips **150** installed into the channels of the lower Post Bracket of this example. Also note the layer of gasketing material or compound **141** on the bottom surface of the Post Bracket **130**.

FIGS. **15**D and **15**E are, respectively, diagonal and end-on perspective detail views of the complementary shapes of the top and bottom edges and surfaces of the Partition Panels **1351** shown in FIG. **15**A, and the shape of the Partition Panel Connector **175**, illustrating how the Partition Panel Connector **175** would seal the gap between the two partition Panels **1351**.

FIG. **16** is a top perspective view of a Post **1251-1252** and Post Bracket **130** assembly top junction, and the components that can be installed to that junction. A Post Bracket Cap **140**, shown both inverted **161** and in its upright installation orientation relative to the top of a Post Bracket **130**, is installed at the top of every Post Bracket **130**, regardless of whether the Post Bracket **130** is installed onto a half-height Post **1251** or a full-height Post **1252**. The inverted view **161** of the Post Bracket Cap **140** shows the recessed channels that will fit down over and around the top of the Post Bracket **130**. The hole in the center of the Post Bracket Cap **140** top surface allows the Post Bracket Cap **140** to be installed over a full-height Post **1252** when necessary, and also allows the installation of the Finial **155** component, shown here in a simple but functional configuration, or the Roof Bracket **180** component. With the Post Bracket Cap **140** installed, the threaded "bolt" element extending from the base of both the Finial **155** and Roof Bracket **180** is screwed by hand into the threaded top portion of the longitudinal hole **102** running the length of the Post **1251-1252**, until the base either of the Finial **155** or Roof Bracket **180** is firmly seated in the hole in the center of

the Post Bracket Cap **140**, as well as against the top surface of the Post **1251-1252**. It can now be seen that, once either the Finial **155** or Roof Bracket **180** has been secured in place, the entire assembly of the Floor Panel Frame Connector **1055**, Post **1251-1252**, Post Bracket **130**, and Post Bracket Cap **140** then would be effectively secured together.

Any channel of a Post Bracket **130** that does not have a Partition Panel **135** installed would be filled by the installation of a Finishing Strip **150**. The Finishing Strip **150** component is shaped and sized to fill one channel of a Post Bracket **130**, and is installed into a channel of the Post Bracket **130** by sliding it fully down into an unoccupied channel of the Post Bracket **130**, thereby providing additional support and solidity to the Post Bracket **130**, preventing the accumulation of detritus in the unoccupied channel, and presenting a visually "finished" appearance to the Post **1251-1252** assembly's outer surface. When installed, its top surface would be level with the top surface of an installed Partition Panel **135**. Note the T-shaped vertical edges of the Partition Panels **1351-1352-1353**, allowing the Partition Panels **1351-1352-1353** to be installed by sliding them down into the T-shaped channels of the Post Bracket **130**.

FIG. **17** is a top perspective view of a roofing subset of components. (The Post Bracket Cap **140** component is the only component shown in this drawing that is not exclusively for roofing.) Because structures will vary in configuration from installation to installation, depending on intended use, not all components shown in this drawing are necessary to roof every structure. However, these are all the components necessary to roof any structure that can be assembled from the Handmade Structure System components. The Roof Bracket **180** component provides the connection point for Roof Beam **1851-1852**, Gutter Block **200**, and Integrated Gutter Section **190** components installed at the top of an installed Post **1251-1252** component. The Roof Beam **1851-1852**, in either single-length **1851** or double-length **1852** configuration, provides horizontal support for the Integrated Gutter Section **190** components. The Integrated Gutter Section **190** component is so-called because it performs two functions: (1) it collects and conveys liquid precipitation from the roofed area of a structure to the periphery of a structure, and (2) it provides the installation point and structural support for the Roof Panel **2451-2452** components. The Downspout **195** component collects, redirects, and conveys the precipitation conveyed by the Integrated Gutter Section **190** components downward through one or more assemblies of Downspout Pipe **220** and Downspout Pipe Extension **225** components toward the installation surface. Gutter Block **200** components prevent the outflow of collected precipitation at one quadrant of a roof junction where a Downspout **195** is not installed. The Junction Seal **205** component provides a water-tight seal at the junction of Roof Beam **185**, Integrated Gutter Section **190**, Roof Bracket **180**, Downspout **195**, and Gutter Block **200** components. Roof Bolt **215** components provide a secure connection of all roofing components installed at the top of an installed Post **1251-1252** assembly, either half-height **1251** or full-height **1252**. The Downspout Pipe Stabilizer **2301-2302** component is used when all or a portion of a full-height structural assembly is roofed. It provides a secure vertical midpoint connection for an assembly of Downspout Pipe **220**/Downspout Pipe Extension **225** components on a full-height structure. Water Fitting **2351** (dispersal) and Water Fitting **2352** (harvesting) components, installed at the bottom terminus of a Downspout Pipe **220** assembly, allow this collected and directed precipitation flow to be either dispersed away from an assembled structure over the installation surface, connected to an external water storage system, or conveyed to a more distant dispersal/collection point, such as a drainage ditch, sewer, etc. Various configurations of Downspout Pipe **220** and Downspout Pipe Extension **225** assemblies and Water Fitting **2351-2352** components allow connection to a water storage system that is either above or below ground, Any water collection/storage/conveyance system is external to the Handmade Structure System components, and is neither described in, nor a part of, this invention.

FIGS. **18**A and **18**B are, respectively, top and bottom combined exploded and assembled perspective views of an Integrated Gutter Section **190** and a "single" Roof Beam **1851**, in their relative installation positions. The Roof Beam **1851** is basically an "I" beam with specially configured end connections and top and bottom surfaces, and provides full horizontal support for the Integrated Gutter Section **190**. The top surface of the Roof Beam **1851** is shaped to accept the installation of an Integrated Gutter Section **190**. The bottom surface of the Roof Beam **1851-1852** is shaped to be installed over the top edge of a Partition Panel **1351-1352**, if one is installed beneath the Roof Beam **1851**, although it is not required that a Partition Panel **135** be installed beneath a Roof Beam **185**. The Integrated Gutter Section **190** fits down over and onto the Roof Beam **1851-1852**. The "channel" **181** in the top longitudinal surface of the Roof Beam **185** accepts the "tab" extrusion **182** along the bottom longitudinal surface of the Integrated Gutter Section **190**. This prevents lateral shifting between the two surfaces when the Integrated Gutter Section **190** is installed onto the Roof Beam **1851-1852**. Each end of the Roof Beam **1851-1852** is shaped as one quadrant (a 90-degree segment of the 360 degrees) of a full circle, with a downward extension of the outer edge of this curved shape equal in depth to the depth of the inner "channel" of a Roof Bracket **180**, into which it will be inserted. Each end of the Integrated Gutter Section **190** has a shape identical to the one-quadrant shape of the Roof Beam **1851-1852** ends, and a downward extension of that "quadrant" shape edge, of a vertical length that brings the bottom of that curved extension flush with the bottom of the vertically downward extension of the Roof Beam **1851-1852** end when the Roof Beam **1851-1852** and Integrated Gutter Section **190** are in their installed positions. The curved, downward extensions at the ends of both the Roof Beam **1851-1852** and Integrated Gutter Section **190** are of equal horizontal thickness, and the combined thickness of these extensions is equal to the horizontal radius of the Roof Bracket **180** inner "channel". When both a Roof Beam **1851-1852** and Integrated Gutter Section **190** are installed into one quadrant of a Roof Bracket **180**, that quadrant of the inner "channel" of the Roof Bracket **180** will be completely filled.

FIGS. **18**C through **18**E show examples of various combinations of Roof Beams **1851-1852**, Integrated Gutter Sections **190**, a Downspout **195** and a Gutter Block **200** being installed to a Roof Bracket at the top of a Post **1251-1252** assembly; note the inter-locking of the various elements of the components. Note that it is possible to install Roof Beams **1851-1852** whether a Partition Panel **1351-1352-1353** is installed beneath them or not.

FIG. **19** is a top and bottom perspective view of a "double" Roof Beam **1852**. A "double" Roof Beam **1852** is structurally equivalent to a combination of two "single" Roof Beam **1851** components, installed into a Roof Bracket **180**, with the Roof Bracket **180** itself installed to a Post Bracket Cap **140**, but as one solid piece. This component allows for a greater span between installed Post **1251-1252** components without a Post **1251-1252** being installed beneath the midpoint, thereby allowing more unobstructed floor space within an assembled structure. The bottom surface of that portion of the "double"

Roof Beam **1852** that is structurally equivalent to a Post Bracket Cap **140** varies from an actual Post Bracket Cap **140** in that it has no channels in its bottom surface shaped to fit over a Post Bracket **130**. Instead, it has a single square cavity **191**, intended to accept an identically-shaped extrusion at the top center of a double-width variation of a Partition Panel **1353** configured as a double door or window, if one is installed beneath the "double" Roof Beam **1852**. (The configuration, materials, form, or functionality of a panel element (hinged or sliding doors, bifold doors, glass or screen panel elements, etc.) of a Partition Panel **1353** that would make use of the square cavity just described is a possible and optional component configuration, and is not included in this specification; only the Partition Panel **1351-1352-1353** frame element is included.) As with the "single" Roof Beam **1851**, the installation of a Partition Panel **1351-1352-1353** beneath a "double" Roof Beam **1852** is not required.

FIG. **20** is a top and bottom perspective view of a "single" **2451** and a "quad" Roof Panel **2452**. A "single" Roof Panel **2451** is used to roof over an area equal to that of a single Floor Panel Frame **100**. A "quad" Roof Panel **2452** is used to roof over an area equal to that of four Floor Panel Frame **100** components assembled into a square. Both configurations of the Roof Panel **2451-2452** have a continuous channel **211** around their bottom periphery. The configuration of elements at the four corners of both "single" and "quad" Roof Panel **2451-2452** components is identical in dimension and structure. Both configurations of the Roof Panel **2451-2452** component have four corner posts, with a hole **212** in the bottom surface of each of the posts threaded to accept a Roof Bolt **215**. Each of the corner posts is positioned to align with the hole **151** in each corner of a Post Bracket Cap **140**. Both configurations have diagonally-intersecting vertical members to provide rigidity and support, although other configurations of these diagonals are possible. These diagonals merge into the posts at each corner.

A "single" Roof Panel **2451** is installed onto four Integrated Gutter Section **190** components contiguously installed at right angles to each other onto four equal-height Post **1251-1252** assemblies in a square configuration above a surface area that would be roughly equal to the surface area of a single Floor Panel Frame **100** assembly, with their four inner side walls effectively forming an open "box" framework. A "single" Roof Panel **2451** will be installed down onto the top of this "box". The continuous channel around the bottom periphery of the "single" Roof Panel **2451** fits snugly down over and onto the top side/edge surface of each of the four Integrated Gutter Section **190** components, thereby sealing the "top" of the aforementioned "box", and conveying precipitation from each of the four sloped surface planes of the Roof Panel **2451** into the four Integrated Gutter Section **190** components onto which it is installed.

A "quad" Roof Panel **2452** is installed onto a larger square "box" frame formed by two Integrated Gutter Section **190** components installed end-to-end on each of the four sides of this larger "box". The end-to-end Integrated Gutter Section **190** components forming each side of this larger "box" may be installed onto a "double" Roof Beam **1852**, or two "single" Roof Beam **1851** components. Because each side of the "quad" Roof Panel **2452** spans the gap between two Integrated Gutter Section **190** components installed end-to-end, the midpoint of each side of the "quad" Roof Panel **2452** is configured with two (2) equivalents of the posts in each corner, for a total of twelve (12) posts. The "quad" Roof Panel **2452** has thickened portions **214** at the underside center of each sloped plane, to provide additional strength and support for the larger surface area of each plane. These thickened portions **214** taper in horizontal width from each of the side connecting points of the "quad" Roof Panel **2452** to the underside apex of the "quad" Roof Panel **2452**.

FIG. **21**A is a top and bottom perspective detail view of a corner connection point of both "single" **2451** and "quad" **2452** Roof Panel **2451-2452** components, while FIG. **21**B is an inverted view of one of the four side connection points of a "quad" Roof Panel **2452**. When either configuration of the Roof Panel **2451-2452** is in its installed position, the threaded hole **212** in each of these posts will align with the unthreaded holes **151** in each corner of the Post Bracket Cap **140** upon which the bottom surface of the Roof Panel **2451-2452** posts rests, or the structural equivalent of a Post Bracket Cap **140** at the center of a "double" Roof Beam **1852**. This alignment allows the upward insertion of a Roof Bolt **215** through the unthreaded hole **151** in the corner of the Post Bracket-Cap **140**, or the structural equivalent of the Post Bracket Cap **140** at the center of a "double" Roof Beam **1852**. The Roof Bolt **215** components are then screwed by hand into the threaded holes **212** in the bottom of the Roof Panel **245** corner posts. Four (4) hand-tightened Roof Bolt **215** components are required to secure a "single" Roof Panel **2451** in place, while twelve (12) Roof Bolt **215** components are required to secure a "quad" Roof Panel **2452**; one at each corner, and two at each side connection point.

FIG. **22** is a top perspective view of a roofing-connection-and-sealing-components assembly at one side connection location for a "quad" Roof Panel **2452**. In this particular example, the two (2) Integrated Gutter Section **190** components have been installed onto a "double" Roof Beam **1852**, but could have been installed onto two "single" Roof beam **185** components installed end-to-end. Both sides of this particular Roof Bracket **180** assembly have been filled with Gutter Block **200** components. Note the shape formed by the top edge surfaces of the Integrated Gutter Section **190** components and the Gutter Block **200** components, and how that shape matches the shape of the peripheral channel **211** at the midpoint of the "quad" Roof Panel **245** shown in FIG. **21**. Each midpoint connection point of the "quad" Roof Panel **2452** will fit down over and onto an identical configuration of Integrated Gutter Section **190** and Gutter Block **200** components at each side of the square being roofed by the "quad" Roof Panel **2452**.

FIGS. **23**A and **23**B are perspective views of a "quad" Roof Panel **2452** being installed to the midpoint of a "double" Roof Beam **1852** (FIG. **23**A), and in its installed location (FIG. **23**B). These figures illustrate how the positioning of the "quad" Roof Panel **2452** brings the two posts at each midpoint of that "quad" Roof Panel **245** into alignment with the corner holes **151** of the Post Bracket Cap **140**, or its structurally equivalent portion of a "double" Roof Beam **1852**, at that midpoint. FIG. **23**A shows the "quad" Roof Panel **2452** in position to be lowered onto the installed Integrated Gutter Section **190** and Gutter Block **200** components at this side of the "quad" Roof Panel **2452**. FIG. **23**B shows the "quad" Roof Panel **2452** in its installed position, relative to the other components at this location. Each of the "quad" Roof Panel **2452** component's four (4) side midpoints will fit onto and over the components at their respective locations. With all components at this location installed, one (1) Roof Bolt **215** will be upwardly inserted through each of the four (4) holes **151** in the corners of either the Post Bracket Cap **140**, or, as in this example, the structurally-equivalent portion of a "double" Roof Beam **1852**, and screwed into the threaded holes **212** of the "posts" of the Roof Panel **245**, if one is installed, or into the threaded holes of Roofing Clamp **210** components otherwise.

FIGS. **24**A and **24**B are, respectively, inverted and upright perspective views of connecting and sealing components for roofing.

From top to bottom, in each figure, respectively, the components are: 1) the Roofing Clamp **210**. This component is used to secure each corner joint of a roofing component juncture that is not occupied by the corner and post element of a Roof Panel **2451-2452** at one corner of an installed Post **1251-1252** assembly, either half-height **1251** or full-height **1252**. The Roofing Clamp **210** has a vertical post element, analogous to the corner posts of a Roof Panel **245**. The vertical element of the Roofing Clamp **210**, like the corner posts element of a Roof Panel **2451-2452**, has a threaded hole **212** in its center bottom surface. The top portion of the Roofing Clamp **210** is shaped to fit snugly down over the corner joint formed by the juncture of two Downspout **195** components, or the juncture of two Gutter Block **200** components, or the juncture of a Downspout **195** and a Gutter Block **200**, installed adjacently and at right angles to each other, into a single Roof Bracket **180**, and after the installation of a Junction Seal **205** component. The bottom surface of the vertical post element of a Roofing Clamp **210** will rest on the top corner surface of either a Post Bracket Cap **140**, or the structurally-equivalent portion of a "double" Roof Beam **185**; 2) the Roof Bolt **215** component. The Roof Bolt **215** has a shaft threaded to screw into either the threaded hole **212** in a Roofing Clamp **210**, or the threaded hole in the posts of a Roof Panel **2452451-2452**. The head of the Roof Bolt **215** has a large "tang" to enable the hand-installation of the bolt; 3) the Junction Seal **205** component. This component is formed to fit down into the "four-cornered" junctions of Downspouts **195**, Gutter Blocks **200**, Integrated Gutter Sections **190**, or any combination thereof, installed at the top junction of Post **1251-1252** assemblies, the configuration of said assemblies determined by the desired or required roofing configuration of an assembled structure. It seals all the vertical seams between these components, and also seals the horizontal seams between components installed into the Roof Bracket **180** that supports the entire grouping of roofing components installed to the Roof Bracket **180**. The round extrusion on the bottom surface of the Junction Seal **205** fits into the hole in the top of the central column of a Roof Bracket **180**, to prevent lateral shifting of its bottom surface relative to the top surface of the Roof Bracket **180** onto which it is installed; 4) the Downspout **195** component. This component captures liquid precipitation flowing to it from the Integrated Gutter Section **190** components, and redirects that precipitation downwardly through its "pipe" element downwardly into a Downspout Pipe **220** toward the installation surface. The top "floor" of the Downspout **195** has a hole with a beveled or chamfered "lip" to facilitate water flow into the downwardly-oriented "pipe" element of the Downspout **195**. The ends of the side wall are vertically angled at 45 degrees to allow them to fit flush with adjacently-installed Downspout **195** components, or Gutter Block **200** components, or Integrated Gutter Section **190** components, whichever might be installed adjacent to the Downspout **195**. The top surface of the Downspout **195** "floor" that is installed over and into a Roof Bracket **180** is "stepped down" from the remaining "floor" surface, to allow the Junction Seal **205** component, when installed, to bring the entire top surface of this junction of components to a horizontally flush and even level with the top "floor" of the Integrated Gutter Section **190**. The bottom end of the "pipe" element of the Downspout **195** is threaded on its outside surface to allow Downspout Pipe **220** or Downspout Pipe Extension **225** components to be screwed by hand onto the "pipe" element of the Downspout **195**. That curved and downwardly projecting portion of the Downspout **195** that will be inserted into the Roof Bracket **180** is shaped identically with those portions of the Roof Beam **1851-1852** and Integrated Gutter Section **190** components that insert into the top inner channel of a Roof Bracket **180**. The thickness of the curved downwardly-extending portion of the Downspout **195** is equal to the combined thickness of the portions of the Roof Beam **185** and Integrated Gutter Section **190** components that are inserted into the circular channel on top of the Roof Bracket **180**, thereby entirely filling one quadrant of the circular channel of the Roof Bracket **180**, when installed. The remaining portion of the "base" element of the Downspout **195** will rest on the top surface of the Post Bracket Cap **140** installed below it, or the structurally-equivalent portion of a double Roof Beam **1852**, with the curved inner surface of the "base" element of the Downspout **195** resting flush against the round outer side wall of the Roof Bracket **180**; 5) the Gutter Block **200** component is shown. This component is physically equivalent to the supporting "base" portion of a Downspout **195**, and the curved connecting portion that is inserted into the Roof Bracket **180**, but with a straight and solid "back" wall at a right angle to its side walls, instead of the curved vertical side wall of the Downspout **195**. It installs in exactly the same manner as a Downspout **195**, and is used to close one quadrant of a Roof Bracket **180** assembly at which no Downspout **195** is installed. Like the Downspout **195**, the curved inner surface of its supporting "base" will rest flush against the round outer side wall of the Roof Bracket **180**. It will prevent water from flowing out of one quadrant of one junction of roofing components at the top of a Post **125** assembly.

FIG. **25** is a front exploded perspective view of an example corner assembly of supporting and connecting components for a Roof Panel **2451** installation. In this example, a Post Bracket Cap **140** will be installed atop an installed Post **1251-1252**, with a Post Bracket **130** having been slid down over the Post **1251-1252**, and Finishing Strip **150** components installed into the side channels of the Post Bracket **130**. This Post **1251-1252** assembly may be either half-height **1251** or full-height **1252**, as both half-height and full-height structures may be roofed. The threaded "bolt" element of a Roof Bracket **180** will be inserted through the Post Bracket Cap **140** and screwed into the threaded hole **102** in the top of the Post **1251-1252**. In this example, a "single" Roof Beam **1851** will be installed into one quadrant of the Roof Bracket **180**, and a "double" Roof Beam **1852** will be installed into an adjacent quadrant of the Roof Bracket **180**. Two (2) Integrated Gutter Section **190** components are shown being installed, one onto the "single" Roof Beam **1851** and one onto the "double" Roof Beam **1852**.

FIG. **26** is an elevated front perspective view of the same example corner assembly shown in FIG. **25**, showing the relative installation positions of precipitation-directing and sealing components after the components shown in FIG. **25** have been installed. With the Roof Beam **1851-1852** and Integrated Gutter Section **190** components installed, this example corner assembly will be completed by installing a Downspout **195** and a Gutter Block **200** into the quadrants of the Roof Bracket **180** not filled by Integrated Gutter Section **190** components, with a Junction Seal **205** then installed to seal this junction of components at the Roof Bracket **180**. Then a "single" Roof Panel **2451** will be installed downwardly into the corner formed by the Integrated Gutter Section **190** components. Three (3) Roofing Clamp **210** components will be installed down over the three "outside" corners of the junction. Three (3) Roof Bolt **215** components will be inserted upwardly through the respective corners **151** of the

Roof Bracket **180** Cap and screwed into the threaded holes **212** in the Roofing Clamp **210** components, while a fourth Roof Bolt **215** (not visible here) will be inserted through the fourth (inside) corner hole **151** of the Post Bracket Cap **140** and screwed into the threaded hole **212** in the immediate corner post element of the "single" Roof Panel **2451**.

FIGS. **27**A and **27**B are, respectively, an elevated front perspective view of the installation of a Junction Seal **205** component onto the junction of components installed at this example junction assembly as shown in FIGS. **25** and **26**, and, in FIG. **27**B, an elevated front perspective view of the now-installed Junction Seal **205** component. The Downspout **195** and Gutter Block **200** components are shown in their installed positions relative to the Roof Bracket **180**, Roof Beam **1851-1852** and Integrated Gutter Section **190** components. This view further illustrates the manner in which a variable combination of components can be arranged at the Roof Bracket **180** to accommodate any desired or required configuration of roofing assembly. The Junction Seal **205** completes any combination of installed components at a Roof Bracket **180**, making it ready for the installation of Roof Panel **2451-2452** and/or Roofing Clamp **210** components.

FIG. **28** is an exploded front perspective view of the relative installation positions of the final connecting and sealing components at this example junction. With the completed assembly of all other components at this example junction assembly, the Roofing Clamp **210** and Roof Panel **2451** components are installed. With the Roofing Clamp **210** and Roof Panel **2451** components in their installed positions, four (4) Roof Bolt **215** components will be inserted upwardly through the holes **151** in the corners of the Roof Bracket **180** Cap, and screwed into the threaded holes **212** in the Roofing Clamp **210** and Roof Panel **2451** post elements.

FIG. **29** is an elevated front perspective view of the completed example corner installation of roofing components shown in FIGS. **25** through **28**. With four (4) Roof Bolt **215** components at each junction (one at each corner) regardless of the combination of components joined at the junction, each junction is securely fastened to the Post **1251-1252** assembly beneath it. The installation of a variety of roofing components is possible at any junction, depending on the desired configuration of the assembled structure, and the desired configuration of the roofing. It is not necessary to roof an entire structure. It is possible to roof only a portion of an assembled structure, and the area covered by the roofed portion need not correspond to the floored portion of the assembled structure.

FIGS. **30**A through **30**D are front exploded perspective views of an example series of possible combinations of Downspout **195**, Downspout Pipe **220**, Downspout Pipe Extension **225** and Water Fitting **2351-2352** component combinations. The pipe components are configured in two (2) lengths. The longer of the two is the Downspout Pipe **220**, while the shorter is the Downspout Pipe Extension **225**. The tops of the Downspout Pipe **220** and Downspout Pipe Extension **225** are threaded along their inner surfaces at a length equal to the length of the threading on the outside surface of the "pipe" portion of the Downspout **195**. The Downspout Pipe **220** and Downspout Pipe Extension **225** components may be screwed together by hand in any desired or required configuration, and either may be screwed by hand onto the threaded "pipe" portion of the Downspout **195**, thereby extending the water-conducting length of that component downward toward the installation surface.

The Downspout Pipe Extension **225** typically would be used to connect two (2) Downspout Pipe **220** components assembled to a full-height roofed structure, allowing the water flow to reach near the installation surface.

Depending on the height of the structure to which the Downspout **195** and its related components are to be installed, and also depending on the purpose desired by the installer, the combinations of these components for any particular assembly is completely variable.

The assembly shown in FIG. **30**A could be used at a Downspout **195** assembly on a full-height structure to convey precipitation to a point near the installation surface, there to be either dispersed or harvested. At this near-installation-surface level, the harvesting configuration of the Water Fitting **2352** would allow connection to an underground water storage system, or conveyance of the water to a drainage system at some distance from the assembled structure, while the dispersal configuration Water Fitting **2351** would allow the dispersal of the water horizontally across and onto the installation surface. Refer to FIG. **32**C for examples of the assembly shown in FIG. **30**A.

The assembly shown in FIG. **30**B would allow connection at a point from just below the vertical midpoint of a full-height structure to an above-ground water storage system, such as a rain barrel or trough, for example. FIG. **32**C also shows an example of this assembly.

The assembly shown in FIG. **30**C allows precipitation directed from a half-height roofed structure to be either dispersed over the installation surface, or connected to an underground storage system, or conveyed to a more distant drainage system. FIG. **32**D shows an example of this assembly.

The assembly shown in FIG. **30**D would allow precipitation directed from a half-height roofed structure to be connected to an above-ground storage system, such as a rain barrel or trough, for example. FIG. **32**D also shows an example of this assembly.

As stated, these are only some of the possible configurations. Other configurations could be assembled, as desired or required. In each assembly where the harvesting configuration Water Fitting **2352** is used, the Water Fitting Cap **240** would be used to seal a threaded coupler of Water Fitting **2532** where a connection to a water storage system from both threaded couplers of Water Fitting **2352** is not made.

FIG. **31** is a front perspective view of configurations of Water Fitting **2351-2352** components. If precipitation conveyed from the roofed portion of a structure is to be dispersed over the installation surface, then the dispersal configuration of the Water Fitting **2351** would be used. If this conveyed precipitation is to be collected (harvested) into a water storage system, the harvesting configuration of Water Fitting **2352** would be used. It is possible to use both fittings on the same assembled structure, although only one Water Fitting **2351-2352** component can be installed at the bottom terminus of any individual Downspout Pipe **220** assembly at a time. Except for the fan-shaped "exit" portion, both configurations are identical. The dispersal configuration simply redirects the flow of water at a horizontal 90 degree angle, presumably away from the assembled structure. The harvesting configuration has two threaded connectors set into a "plate" or "wall" obstructing the fan-shaped "exit" portion of Water Fitting **2351**. These threaded connectors are of a size and threading to allow the connection of standard garden hoses or their equivalents to the two threaded outlets. The Water Fitting Cap **240** is used to seal a connector when no connection is made between one of the threaded outlets of the harvesting configuration and a water storage system. Like the threaded connector at each end of a standard garden hose and the body of the hose itself, the top **311** and bottom **312** portions of both Water Fitting **2351-2352** components rotate freely and independently of

each other about their connecting juncture, allowing the Water Fitting **2351-2352** to be oriented to any desired or required direction.

FIGS. **32**A and **32**B are, respectively, a top and bottom perspective exploded and assembled views of an installation of Downspout Pipe Stabilizer **230** components into the corner holes **151** of a Post Bracket Cap **140**. Downspout Pipe Stabilizer **230** components are typically used only with full-height assembled structures at those locations that have Downspout **195** assemblies installed. The Downspout Pipe Stabilizer **230** component has two configurations: 1) "Corner" **2301**, and 2) "Side" **2302**. The corner configuration **2302** is used at an "outside" corner of an assembled structure, when two Downspout **195** assemblies are installed adjacent at a right angle to each other at a single Post **1252** assembly. The "side" **2301** configuration is used at any other location where a Post Bracket Cap **140** has two adjacent corner holes available and a Downspout **195** assembly is installed. (Note: Downspout **195** assemblies, including Downspout Pipe Stabilizer **230** components, cannot be installed at an "inside", or ninety-degree L-shaped, corner of an assembled structure.)

The Downspout Pipe Stabilizer **230**, in either configuration, consists of a ring element with an inside diameter large enough to allow a Downspout Pipe **220** or Downspout Pipe Extension **225** to fit snugly but smoothly through it. It is used at the approximate vertical midpoint of a full-height Downspout **195** assembly, or near the bottom of a Downspout **195** assembly extending downward from a Downspout **195** installed to approximately the vertical midpoint of a full-height structure (refer to FIG. **30**B), typically for connection to an above-ground water storage system.

The "side" **2301** configuration has two (2) downward-projecting cylindrical extrusions at each end of a horizontal connecting bar. The two extrusions insert into two adjacent corner holes **151** of a Post Bracket Cap **140**. The ring element is thus aligned with an installed Downspout **195** assembly, with the Downspout Pipe Extension **225** fitting inside the ring. This component provides stability to the Downspout **195** assembly by limiting vibration or other lateral movement of the Downspout **195** assembly caused by wind or the flow of water downward through the assembly. The "corner" configuration has an L-shaped horizontal connecting bar, with three (3) cylindrical downward-projecting extrusions, and is installed into three (3) Post Bracket Cap **140** corner holes **151**. It provides the same stability for two Downspout **195** assemblies installed adjacent at a right angle to each other at an outside corner of an assembled full-height structure, that the "side" configuration provides for a single Downspout **195** assembly.

FIGS. **32**C and **32**D are perspective views of example structures illustrating possible combinations of Downspout **195**, Downspout Pipe **220**, Downspout Pipe Extension **225**, and Water Fitting **2351-2352** components, as they could be installed to either half-height or full-height structures or assemblies. The tray-like implements shown beneath certain installed combinations of Downspout **195**, Downspout Pipe **220**, Downspout Pipe Extension **225**, and Water Fitting **2351-2352** components, are not components of the invention in this disclosure, and are shown for illustrative purposes only.

FIG. **33** is an elevated front perspective view of an example fully-enclosed and roofed structure. This example structure illustrates some possible combinations of the Handmade Structure System components, and is intended to give a general idea of the possibilities for assembling structures using this invention. Although this example structure is basically rectangular, the inclusion of the roofed "porch" illustrates that this system of components is not limited to rectangular structures, nor is there any inherent limitation to the size or configuration of an assembled structure. The roofed "porch" also illustrates that the two Roof Panel **2451** and **2452** configurations and sizes can be used in a single structure. The Partition Panel **1351-1353** components shown in this example illustrate the variability of materials used for the interior "panel" portion of the Partition Panel **1351**,**1352**, **1353**, as they are shown here as being of a mesh screen material, rather than a solid (unperforated) "panel" element as illustrated in previous figures. Again, materials, configuration, functionality, etc. of the "panel" element is not included in this disclosure; any "panel" elements of a Partition Panel **1351-1352-1353** shown in this disclosure are shown only for illustration. The Floor Panel **110** components used to provide the floored surface of the "porch" illustrate that the Floor Panel **110** surface need not be solid (unperforated), but could also be "slotted" or "ventilated" (perforated), to allow precipitation to drain through the Floor Panel surface. The surface finish, materials, and decoration of the "panel" portions of Partition Panel **1351**, **1352**, and **1353** components, as well as the top surface of Floor Panel **110** components, is completely variable, allowing great flexibility in both the appearance and utility of these surfaces. Only the physical configuration and dimensions of the elements of floor panels and partition panels that fit into or connect with other components of the system are fixed or required. With the appropriate fittings installed to either a Partition Panel **135** or Floor Panel **110**, it would be possible to conduct water, electricity, or heating/cooking gas into a structure. The configurations of Partition Panel **1351**, **1352**, **1353** components make possible fully functional windows in a variety of forms, bifold doors, wire-mesh panels, etc. While this example illustrates a full-height structure, it is possible to create fully-enclosed and roofed half-height structures (refer to FIG. **32**D), or partially-enclosed and/or partially-roofed structures, and structures with separate sections or portions of variable height, enclosure, roofing, etc.

Since other modifications and changes varied to fit particular operating requirements and environments will be apparent to those skilled in the art, the invention is not considered limited to the example chosen for purposes of disclosure, and covers all changes and modifications which do not constitute departures from the true spirit and scope of this invention.

Having thus described the invention, what is desired to be protected by Letters Patent is presented in the subsequently appended claims.

What is claimed is:

1. A system of integrated structural components for assembling variably-configured structures, with connection and support of said integrated structural components allowing said variably-configured structures to to be assembled without requiring the use of any tools by each of the integrated structural components being designed to slide together, screw together, or latch together, the system of integrated structural components comprising:

one or more floor panel frames, each of said one or more floor panel frames providing a supporting framework for a floor panel, said floor panel configured to be lowered into place and to fit into one of said one or more floor panel frames, wherein said one or more floor panel frames are shaped as a square table top with four legs, one of each of said four legs being located at a bottom corner of said square table top, said square table top comprising a square vertically recessed area, said square vertically recessed area consisting of: a square peripheral shoulder or rim with corners; a center; and horizontal support members extending diagonally from the cor-

ners of said square peripheral shoulder or rim toward the center of said square vertically recessed area and merging into a hollow, downwardly-projecting cylinder, a bottom surface of said hollow, downwardly-projecting cylinder providing a center support for said one or more floor panel frames and said floor panel, the bottom also providing an insertion point for a foundation anchor; a bottom opening of said hollow, downwardly-projecting cylinder having a smaller diameter than a top opening of said hollow, downwardly-projecting cylinder, thereby forming an obstructing shoulder or lip at said bottom opening;

said four legs each having a horizontal cross-section shaped as one quadrant of a flat toroid, each of said four legs insertable into a floor panel frame connector, with said four legs providing corner support for said one or more floor panel frames; wherein each of said four legs further comprising two round holes in a bottom surface extending upwardly into each of said four short legs, wherein said two round holes to receive a corresponding connector column of said floor panel frame connector; in a top surface of each corner of said square peripheral shoulder or rim of said square vertically recessed area is a slot, said slot connecting downwardly to a latch chamber, said latch chamber in the shape of two diagonally opposed quarter-circles;

said floor panel having corners and a horizontally-projecting top surface rim or lip, said horizontally-projecting top surface rim or lip resting on and supported by said square peripheral shoulder or rim of said square recessed area of said square table top of said one or more floor panel frames, and with a bottom surface shaped to fit onto and over and around upper surface portions of said horizontal support members and said hollow, downwardly-projecting cylinder of said one or more floor panel frames; wherein said floor panel is installed to said one or more floor panel frames by being lowered into place and secured at each corner to said one or more floor panel frames by a floor panel latch; said floor panel also having a slot in each corner, said slot centered within a round counter-sunk surface and vertically penetrating said floor panel;

said floor panel latch being configured for securing said floor panels to said one or more floor panel frames, said floor panel latch comprising a round top and a downwardly-projecting T-shaped flange, said round top having a cross-bar protruding upwardly from a vertically-recessed surface to allow said floor panel latch to be rotated horizontally by hand; wherein when said T-shaped flange is inserted through said slot in said each said corner of said floor panel, with said T-shaped flange continuing into said latch chamber, said floor panel latch is rotated ninety degrees clockwise, thereby placing said T-shaped flange in opposition to said slot in a top surface of each said corner of said square peripheral shoulder or rim of said square vertically recessed area of said one or more floor panel frames, thereby securing said corner of said floor panel to said one or more floor panel frames;

said floor panel frame connector comprises a plurality of variously-configured floor panel frame connectors for connecting and supporting two or more of said one or more floor panel frames into a variable horizontal arrangement or floor plan, wherein at least one of said plurality of variously-configured floor panel frame connectors being configured to receive a post wherein said post provides vertical support for a post bracket;

said plurality of variously-configured floor panel frame connectors being individually configured to receive, support, and connect said four legs of one, or two, or three, or four of said one or more floor panel frames in a right-angle, four-quadrant radial pattern, said one or more floor panel frames being installed by being lowered into place onto said plurality of variously-configured floor panel frame connectors;

a first connector configuration of said plurality of variously-configured floor panel frame connectors comprising a full-circle flat base having a periphery and an upwardly-projecting round center column, with eight connector columns symmetrically and radially arranged and spaced around said round center column, each of said connector columns equidistant between the periphery of said full-circle flat base and a side surface of said upwardly-projecting round center column, and projecting upwardly from a surface of said full-circle flat base;

three additional different connector configurations of said plurality of variously-configured floor panel frame connectors deriving from a full-circle configuration comprising three-quarters of said full-circle configuration, one-half of said full-circle configuration, and one-quarter of said full-circle configuration; each of the additional different connector configurations comprising a round center column containing a vertical unthreaded bore hole in the center of a top surface of said round center column;

a fifth connector configuration of said plurality of variously-configured floor panel frame connectors comprising a threaded hole in a top center surface of an upwardly-projecting round center column, and an upwardly-projecting sidewall around a periphery of a full-circle flat base; said threaded hole configured to accept a threaded end of a variable-height post, thereby allowing the installation of partitioning components or roofing components;

said variable-height post includes a plurality of variable-height posts comprising a threaded bottom outer surface, a center hole running a full length of said variable-height post, said center hole being threaded at a top portion of said variable-height post, allowing for screw-in installation of either a finial or said roofing components;

edge frame sections for providing filler to said plurality of variously-configured floor panel frame connectors and providing a finished edge; said edge frame sections having downwardly-projecting leg elements identical in configuration to said four legs of said one or more floor panel frames,

a post bracket, consisting of a square core having four sides, with a center bore hole running a full length of said square core of said post bracket, and with a T-shaped channel running a full length of each of the four sides of said square core, said T-shaped channel for receiving a partition panel frame or a finishing strip; and wherein said post bracket is installed by sliding said post bracket down onto and over said plurality of variable-height posts;

partition panel frames configured to be slidably inserted into said T-shaped channel running the full length of said each of the four sides of said square core of said post bracket, said partition panel frames being of a generally rectangular shape, and having a vertical side element with a horizontally-oriented T-shape, said horizontally-oriented T-shape corresponding to said T-shaped channel of said post bracket;

said finishing strip configured to be installed into said T-shaped channel of said post bracket into which no partition panel frame is installed;

a junction cap, said junction cap configured to be installed to any of the plurality of variously-configured frame connections to prevent the accumulation of water, debris or other detritus;

a post bracket cap, fitted to said post bracket, for providing a physical support and functional connection at a top of said post bracket for said roofing components or said finial; said post bracket cap configured as a square, with a bore hole in a center top surface of said post bracket cap, said bore hole extending vertically through a body of said post bracket cap; said post bracket cap also having vertical bore holes in each corner of, and extending through the body of, said post bracket cap; said post bracket cap also having four smaller-diameter vertical bore holes arranged symmetrically around said vertical bore hole in said center top surface of said post bracket cap, said vertical smaller-diameter bore holes extending through the body of said post bracket cap; a bottom surface of said post bracket cap has channels corresponding to a shape of the top upwardly-projecting surface of said post bracket, with said channels in said bottom surface of said post bracket cap being of a depth sufficient to cover and envelop said top upwardly-projecting surface of said post bracket; and

said finial having a variably-configurable upper body element and a downwardly-projecting threaded bolt element, said finial installed by screwing said threaded bolt element into said variable-height posts.

2. The system of integrated structural components in accordance with claim **1**, further comprising said roofing components, wherein said roofing components comprise:

a roof bracket configured as a hollow cylinder with a smaller-diameter cylindrical central column projecting upwardly from a floor of said hollow cylinder, with a bore hole in a top surface of said cylindrical central column, with a resultant circular channel between a sidewall of said hollow cylinder and a vertical side surface of said smaller-diameter cylindrical central column, with said roof bracket also having a threaded bolt element projecting downwardly from a base of said roof bracket; wherein said roof bracket is installed by inserting said bolt element through the bore hole of said post bracket cap, said post bracket cap serving as a support for said base of said roof bracket, with said bolt element screwed into said variable-height posts; said circular channel of said roof bracket receiving downwardly-projecting curved tangs at the ends of roof beams, gutter blocks, and downspouts, with one said roof beam, said gutter block, and said downspout installed into said circular channel of said roof bracket

said roof beams, each of said roof beams having end elements with said end elements of said roof beam configured to be inserted into said roof bracket, with said roof beam of a variable length and a mid-point configuration for providing connectivity and horizontal support for said roofing components; said end elements, having an outermost curved downwardly-projecting tang shorter than an innermost curved downwardly-projecting tang, said outermost and innermost curved downwardly-projecting tangs configured to fit over and onto said roof bracket, with the outermost downwardly-projecting tang inserted into said circular channel of said roof bracket while the said innermost curved downwardly-projecting tang rests on and is supported by a top edge surface of said post bracket cap; said outermost curved downwardly-projecting tang of said roof beam only fills one-half of a horizontal radial thickness of said circular channel; said roof beam having two different configurations consisting of a single configuration and a double configuration having longitudinal supporting elements, wherein the longitudinal supporting elements are formed as I-beam elements, and said double configuration of said roof beam provides for a greater span of support and said single configuration of said roof beam accepts one integrated gutter section, while said double configuration of said roof beam accepts two said integrated gutter sections; a top surface of said I-beam element is longitudinally divided by a continuous channel running a full length of said I-beam element; each end of said top surface of said I-beam element is wedge-shaped so as to occupy only one-quadrant of a top circumferential area of said roof bracket, thereby allowing up to four said roof beams to be installed into one said roof bracket;

said integrated gutter sections configured to be inserted into said roof bracket and onto said roof beams for providing a conduit for conveying precipitation and serving as a connection point for a roof panel; each end of said integrated gutter section has a single curved downwardly-projecting tang, said curved downwardly-projecting tang to be inserted into said circular channel of said roof bracket; said integrated gutter sections have a longitudinal downwardly-projecting tab running a full length of a bottom surface of said integrated gutter sections, with said longitudinal downwardly-projecting tab inserted into said continuous channel in said top surface of said roof beam, for providing a seal against precipitation ingress, and resisting lateral or horizontal; and further comprising top edge portions of upwardly-projecting sidewalls for serving as receivers and supports for said roof panel;

a gutter block, configured to be inserted into said roof bracket to block the outflow of precipitation conveyed to said roof bracket by said integrated gutter sections, wherein the gutter block serves as a connection point said roof panel; said gutter block comprising a barrier end wall;

a downspout, configured to be inserted into said roof bracket via curved downwardly-projecting tangs to collect and funnel precipitation conveyed to an installation point of said roof bracket by said integrated gutter sections or said gutter;

a downspout pipe, comprising a cylindrical tube or pipe, connectable with said downspout or a downspout pipe extension to a water fitting, via a threaded inner surface at a top of said downspout pipe, and a threaded inner surface at a bottom of said downspout; said downspout pipe for conveying precipitation collected and drained by said downspout from a roofed portion of a structure or assembly toward the ground;

a downspout pipe extension, identical with said downspout pipe except for being shorter in length, for allowing variations in overall height;

a downspout pipe stabilizer having two configurations, one said configuration to be installed into said bore holes in of said post bracket cap, or into three said bore holes in two of said post bracket cap, said two sides of said post bracket cap adjacent at a shared right angle, said downspout pipe stabilizer consisting of a horizontal supporting and connecting bar and a circular band of an inner

diameter sufficient to allow the passage of said downspout pipe or downspout pipe extension through said circular band;

said roof panel comprising a variously-sized and configured roof panels, configured to be installed onto and supported by sidewalls of said integrated gutter sections, or combinations of the sidewalls of integrated gutter sections and said gutter blocks, and also supported by and secured to said post bracket cap, said sidewalls of said integrated gutter sections, and said sidewalls of said gutter block, via downwardly projecting post elements;

said variously-sized and configured roof panels have square bases with a continuous downward-facing channel encompassing a full periphery; downwardly-projecting post elements at each corner of said square bases, said downwardly-projecting post elements having a vertical threaded hole in a bottom center surface of said post element, and with upwardly-projecting roofing surface elements of a four-sided pyramidal shape; one of said variously-sized and configured roof panels is sized to shelter a horizontal surface area approximately equal to the surface floor area of one said one or more floor panel frames; a second one of said variously-sized and configured roof panel is sized to shelter a horizontal surface area approximately equal to the surface floor area of four said one or more floor panel frames assembled in a square two-by-two arrangement;

a roofing bolt; sized and threaded to be inserted upwardly through a bottom aperture of said bore holes in said corners of said post bracket cap, said roofing bolt screwed into either said roof panel, or into a roofing clamp;

and a roofing clamp consisting of a post element combined with an inverted, hook-shaped element, said roof clamp used to cover and secure a vertical seam between said integrated gutter sections, downspouts, gutter blocks, or any combination thereof, installed to said roof bracket.

3. The system of integrated structural components in accordance with claim **2** further comprising said downspout inserted to said roof bracket, said downspout consisting of: 1 a body configured as an elongated semi-circular floor surrounded by upwardly-projecting sidewalls, with a beveled or counter-sunk hole in said floor a downwardly-projecting pipe element descending from said hole to drain precipitation toward the ground and two curved, downwardly-projecting tangs, wherein an outermost, shorter of said tangs to be inserted into said roof bracket, and a longer, innermost tang to rest on and be supported said post bracket cap; said downspout providing a collection and exit point for precipitation conveyed via said integrated gutter sections.

4. The system of integrated structural components in accordance with claim **3** further comprising a junction seal fitted to said roof bracket, with said junction seal comprising a square flat floor surface, and with upwardly-projecting outward-facing right-angle corner elements, said corner elements cover horizontal and vertical seams; and a round, downward projection from a bottom surface of said square flat floor surface of said junction seal fits into said bore hole in the top surface of said cylindrical central column of said roof bracket.

5. The system of integrated structural components in accordance with claim **3** further comprising a water fitting connected to said downspout pipe or said downspout, for directing precipitation onto an installation surface or to a water containment system; said water fitting having two configurations, said two configurations allowing precipitation outflow to be either dispersed horizontally over the ground, or connected via threaded couplings to a water storage or drainage system; said water fitting have a top threaded element, allowing said water fitting to be screwed onto said downspout, or said downspout pipe, or said downspout pipe extension, and a bottom element, said bottom element configured either for unrestricted outflow of water or an outflow-blocking barrier element pierced by and configured with two threaded couplers, said threaded couplers for connection to an external water conveyance, said conveyance leading to or connecting to an external storage or drainage system or location; the top and bottom elements of said water fitting rotate freely and independently about a connection point.

6. The system of integrated structural components in accordance with claim **1** wherein said post bracket further comprises dowels in a bottom surface of said post bracket for insertion into said plurality of floor panel frame connectors to prevent the rotation of said post bracket around said variable-height post.

7. The system of integrated structural components in accordance with claim **1** wherein said one or more floor panel frames include a ramp for providing an inclined surface between an installation surface and a structure or assembly; said ramp is configured to be installed to said floor panel frame connectors with two short toroidally-shaped legs at a non-inclined end of said ramp.

8. The system of integrated structural components in accordance with claim **1** further comprising an anchor component inserted through said hollow center cylinder of said one or more floor panel frames and screwed into the ground in order to anchor said one or more floor panel frames to an outdoor installation surface; said anchor consists of a top tang for gripping and driving said anchor component into the ground, a retaining disc below the tang, a shaft of variable length, and circular or helical tines at or near a bottom end of a shaft.

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